

**DISTRIBUTION**  
**UNIT MANAGERS' MEETING**  
**200 AREA GROUNDWATER AND SOURCE OPERABLE UNITS**

084917

0054812

Bryan Foley..... DOE-RL RP (A5-13)  
Marvin Furman ..... DOE-RL RP (A5-13)  
Ellen Mattlin ..... DOE-RL EAP (A2-15)  
Mike Thompson ..... DOE-RL RP (A5-13)  
Arlene Tortoso ..... DOE-RL RP (H0-12)  
Lisa Treichel ..... DOE-HQ (EM-442)

Dennis Faulk.....EPA (B5-01)

Brenda Becker-Khaleel ..... WDOE (Kennewick) (B5-18)  
Zelma Maine ..... WDOE (Kennewick) (B5-18)  
Matt Mills..... WDOE (Kennewick) (B5-18)  
John Price..... WDOE (Kennewick) (B5-18)  
Tina Masterson-Heggen ..... WDOE (Kennewick) (B5-18)

Jeff Armatrout ..... BHI (H0-19)  
Chloe Brewster ..... BHI (H0-19)  
Garrett Day ..... BHI (H0-19)  
Bruce Ford ..... BHI (H0-19)  
Greg Mitchem ..... BHI (H0-21)  
Joan Woolard..... BHI (H0-02)

Tim Lee..... CHI (H9-02)  
Virginia Rohay ..... CHI (H0-19)  
L. Craig Swanson..... CHI (H9-02)  
Mary Todd..... CHI (H9-03)  
Curtis Wittreich ..... CHI (H9-03)

Stuart Luttrell ..... PNNL (K6-96)  
Mark Sweeney ..... PNNL (K6-81)

Administrative Record (2) ..... BHI (H0-09)

Please inform Chloe Brewster – BHI (372-9377)  
of deletions or additions to the distribution list.

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Meeting Minutes Transmittal/Approval  
Unit Managers' Meeting  
200 Area Groundwater and Source Operable Units  
3350 George Washington Way, Richland, Washington  
August 2000

084917

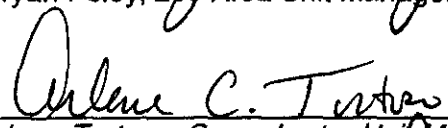
APPROVAL:

  
Bryan Foley, 200 Area Unit Manager, DOE/RL (A5-13)

Date

Dec 13, 2000

APPROVAL:

  
Arlene Tortoso, Groundwater Unit Manager, DOE/RL (H0-12)

Date

Dec. 18, 2000

APPROVAL:

  
Dennis Faulk, 200 Area Unit Manager, EPA (B5-01)

Date

12-26-00

APPROVAL:

  
John Price, 200 Area Unit Manager, Ecology (B5-18)

Date

Dec. 29, 2000

Meeting minutes are attached. Minutes are comprised of the following:

Attachment 1	--	Agenda
Attachment 2	--	Attendance Record
Attachment 3	--	200 Area Current Action Log
Attachment 4	--	200 Area UMM Minutes – August 2000
Attachment 5	--	RCRA TSDs Interim Status of Purex Crib 216-A-10, 216-A-38B, and 216-A-37-1
Attachment 6	--	Comparison of Maximum Carbon Tetrachloride Rebound Concentrations Monitored at 200-ZP-2 Soil Vapor Extraction Sites

Prepared by:

  
Chloe Brewster, BHI GW/VZ Integration Project (H0-19)

Date

9/26/00

Concurrence by:

  
Bruce Ford, BHI GW/VZ Integration Project (H0-19)

Date

11/23/00

# **UNIT MANAGERS' MEETING AGENDA**

3350 George Washington Way, Conference Room 1B-45

August 24, 2000

## **9:00 – 11:00 a.m. 200 Area**

### **General (10 minutes)**

- Outstanding Action Items
- Passive neutron geophysical tool demonstration at Borehole 299-W18-159 (216-Z-1A) Drain Tile/Field and Borehole 299-W18-179 (216-Z-12 Crib) in mid-September
- Update of five-year review

### **200-CW-1 Gable/B Pond and Ditches Cooling Water OU (10 minutes)**

- Work Plan Status
- Remedial Investigation Report Status
  - Summary Results
  - Draft A transmittal 8/10/00 to Ecology; Regulator Review period 8/15-9/15, 2000
- IDW Status

### **200-CS-1 Chemical Sewer OU (5 minutes)**

- Work Plan Status

### **200-CW-5 U Pond/Z Ditches Cooling Water OU (5 minutes)**

- Work Plan Status

### **200-TW-1 Scavenged and 200-TW-2 Tank Waste OUs (5 minutes)**

- Work Plan Status
  - Draft A submittal 8/18/00; Regulator Review 8/20-9/20, 2000

### **200-PW-2 Uranium-Rich Process Waste OU (5 minutes)**

- Work Plan and DQO Schedule
  - DQO Status
  - Draft A Work Plan submittal 12/29/00; Regulator Review 1/01 – 1/31/01

### **200 Area Remedial Action Project (10 minutes)**

- FY 2001 Work Scope Status

### **RCRA Groundwater Monitoring Program (40 minutes)**

- 216-A-10, 216-A-36B, 216-A-37-1, Crib RCRA groundwater monitoring briefing (PNNL)

**200-UP-1 (10 minutes)**

- Status Operational Update
- Signing of Waste Management Plan

**200-ZP-1 (10 minutes)**

- Shutdown of Extraction Well 299-W15-37
- Status Operational Update
- Status of Regulator Review – EPA
- ITRD PITT Demonstration

**200-ZP-2 (10 minutes)**

- Status Monitoring Data Evaluations
- New Data

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**200 Area Unit Managers' Meeting  
OPEN ACTION ITEMS & TRACKING**

Action #	Action/Subject	Assigned To	Owed To	Assigned Date	Original Due Date	Adjusted Due Date	Date Complete	Status
1	Set up meeting between Foley and Mills to discuss 200-CS-1 work plan comments for first week in September.	Foley	Mills	8/24/2000				
2	Faulk to provide approval letter of 200-CW-5 work plan to Foley.	Faulk	Foley	8/24/2000				
3	Ecology and EPA to provide joint approval of the 200 Area Implementation Plan	Faulk/Z. Jackson	Foley	8/24/2000				
4	Day to provide email to Z. Jackson on 200-UP-1 turn on date.	G. Day	Z. Jackson	8/24/2000				
5	Day to provide list of maintenance activities scheduled for 200-ZP-1 to Tortoso.	G. Day	A. Tortoso	8/24/2000				
6	Faulk requested presentation at next UMM on PITT well deepening DOW and DQO efforts.	R. Jackson	Faulk	8/24/2000				

**MEETING MINUTES**  
**200 AREA GROUNDWATER AND SOURCE OPERABLE UNITS**  
**UNIT MANAGERS' MEETING -- 200 AREA**  
**August 24, 2000**

**Agenda:** See Attachment #1

**Attendees:** See Attachment #2

**Topics of Discussion from Agenda:**

1. General:

- Outstanding action items – Bryan Foley (U.S. Department of Energy, Richland Operations Office [RL]) presented the new tracking form and action items will be recorded and tracked (see attached).
- Passive neutron geophysical tool demonstration at borehole 299-W18-159 (216-Z-1A Drain/Tile Field) and borehole 299-W18-179 (216-Z-12 Crib) in mid-September – Bruce Ford reported they originally planned to be in the field in mid-August but moved this activity to September due to contract issues with Three Rivers. This is a hot spot identification tool and the purpose is proof of principle test; therefore, no outside review is planned. Ted Wooley will extend an invitation to other Ecology personnel to watch the demonstration.
- Update of five-year review – Dennis Faulk (U.S. Environmental Protection Agency [EPA]) reported he is currently working on the 200 Area section. Soil sites will have minimal discussion. There will be major discussion with 200-ZP-1 and 200-ZP-2 due to carbon tetrachloride issues. Another major issue coming is the new EPA policy for institutional controls. Records of Decision (RODs) will have to be revised. The original issue date of September is no longer feasible. Dennis Faulk is planning on releasing the first version for review in September, and the new goal is to have the document finalized by the end of November.

2. 200-CW-1 Gable/B Pond and Ditches Cooling Water OU:

- Work Plan Status – The work plan was issued. Ted Wooley (Washington State Department of Ecology [Ecology]) reported that he has comments on the work plan. He will meet with Mary Todd (CH2M HILL, Hanford, Inc. [CHI]) and Bryan Foley after the UMM to discuss these comments.
- Remedial Investigation (RI) Report Status – Ted Wooley reported that he would not initiate review of the RI report until after the work plan was approved by Ecology. However, a new person will start on Monday and be assigned this task. Bryan Foley requested the review start date of the RI report so he could forecast the completion of the review and update the schedule.
- IDW Status – Bryan Foley reported this investigation-derived waste (IDW) has been on the truck at the Environmental Restoration Disposal Facility (ERDF) for the past several weeks and is becoming urgent problem because the work plan has not yet been approved by Ecology. If the work plan will take some time to approve, other waste disposal options will have to be examined.

3. 200-CS-1 Chemical Sewer OU:

- Work Plan Status – Revision 0 has been issued. RL received initial comments from Matt Mills (Ecology), newly assigned to this operable unit (OU). Matt will need more time to review the document but requested a meeting be scheduled the first week in September to discuss his comments (see attached action item log).
- RL reported that the Tri-Party Agreement (TPA) change package has been signed and thanked everyone for their phenomenal efforts.

4. 200-CW-5 U Pond/Z Ditches Cooling Water OU:

- Work Plan Status – Revision 0 has been issued. Dennis Faulk will provide the approval letter to Bryan Foley (see attached action item log).

5. 200-TW-1 Scavenged and 200-TW-2 Tank Waste OUs:

- Work Plan Status – This document is currently in regulator review (from 8/20 to 9/20). Since this OU has Ecology and EPA split responsibility, Dennis Faulk thought he and Zelma Jackson should meet to provide comments. Bryan Foley provided the reasons a document goes through a public review. Dennis Faulk recommends NOT sending the document out for public comment, due to the work previously done at the 200-BP-1 OU. Zelma will need to assess the need for public review of this document, based on the criteria provided by Bryan.

6. 200-PW-2 Uranium-Rich Process Waste OU:

- Work Plan and DQO Schedule – Bryan Foley reported that the work plan is due out by 12/29, according to the TPA milestone. Mary Todd reported that the sections of the work plan are currently being written, but portions will not be completed until DQO items are resolved.
- DQO Status – Mary Todd reported that the external DQO meeting was held 8/8. No comments have been received yet. Zelma reported that several issues need to be addressed internally (RAD levels, use issues), but hopes to have this complete by next Monday (8/28).

7. 200 Area Remedial Action Project:

- FY 2001 Work Scope Status – Work scope is still in progress. Additional details on funding will be provided to the regulators once finalized. The TPA change package signing helped IPL.

#### 8. RCRA Groundwater Monitoring Program:

- 216-A-10, 216-A-36B, 216-A-37-1 Cribs RCRA groundwater monitoring briefing (PNNL) – Jon Lindberg (Pacific Northwest National Laboratory [PNNL]) presented the following information to provide background for the 200-PW-2 work plan: TSD closure plan dates/schedules, geology, past history and use of cribs, constituents detected and monitored, near-field and far-field wells, constituent list exceeding drinking water standards, plume maps, and trend plots (see attached handout). Possible future activities will be replacing wells not currently meeting *Washington Administrative Code* (WAC) 173-160 standards and further evaluation of groundwater flows. The presentation was well received and the regulators appreciated the background information in preparation of the 200-PW-2 work plan.

#### 9. 200-UP-1:

- Status Operational Update – Garrett Day (Bechtel Hanford, Inc. [BHI]) reported that the system was turned off Tuesday, 8/22/00, for ERDF transfer of leachate. Zelma requested an email from Garrett Day indicating when the system was turned back on.
- Signing of Waste Management Plan – It was reported that the waste management plan was signed.

#### 10. 200-ZP-1:

- Shutdown of Extraction Well 299-W15-37 – Bill McMahon reported that this extraction well should be shut down and requested the process for doing this. Dennis Faulk indicated that this information needs to be documented in the Unit Managers' Meeting minutes. Dennis Faulk okayed the shutdown of this well. He also mentioned that the remedial design report (RDR) would need revision to reflect this shutdown.
- Status Operational Update – Garrett Day reported the system is running fine. Garrett will be scheduling routine maintenance activities and wanted to advise attendees of this. Arlene Tortoso (RL) requested a list from Garrett Day of the activities involved.
- Status of Regulator Review – Dennis Faulk (EPA) would like a re-look at the entire 200-ZP-1 OU network.
- ITRD PITT Demonstration – Arlene reported there is currently \$1.1 million in the budget for this program. Questions have been provided to the Expert Panel to resolve and provide guidance. There may be a possibility of Lead Lab review. Dennis Faulk requested a presentation at the next UMM on the PITT well deepening description of work and data quality objective (DQO) efforts.

#### 11. 200-ZP-2:

- Status Monitoring Data Evaluations – Tim Lee reported that monitoring continues. The August passive data is currently being evaluated.

- New Data – Tim Lee provided the compilation of July data to Dennis Faulk (see attached).

**Other Items:**

1. Arlene Tortoso indicated that Joan Woolard (BHI) would be requesting a meeting be set up with Dennis Faulk (EPA) to provide waste issues briefing. Joan will request EPA's approval/okay for the Central Waste Complex.
2. Dennis Faulk reported the multi-media issue is very close to being resolved/settled.
3. Ted Wooley (Ecology) reported that the new Ecology Clean-up Project Manager would start Monday.
4. Ted Wooley's last day is September 6, 2000. A new Ecology person will be responsible for the 200-CW-1 OU. It is unknown at this time who that person will be.
5. Ecology and EPA will provide a joint approval on the 200 Area Implementation Plan.

## 2.0 Location and Facility Descriptions

The Hanford Site is located in south-central Washington State approximately 170 miles (272 km) east of Seattle and 130 miles (208 km) southwest of Spokane (Figure 2.1). The Hanford Site was initially established in 1943 by the U.S. Army Corps of Engineers as the location for plutonium production reactors and associated plutonium extraction facilities. Two of the PUREX cribs (A-10 and A-36B) are located in the southeast corner of the 200 East Area (Figure 2.1). The third crib (A-37-1) is located about 420 m east-northeast near the Grout Facility (Figures 2.1 and 2.2).

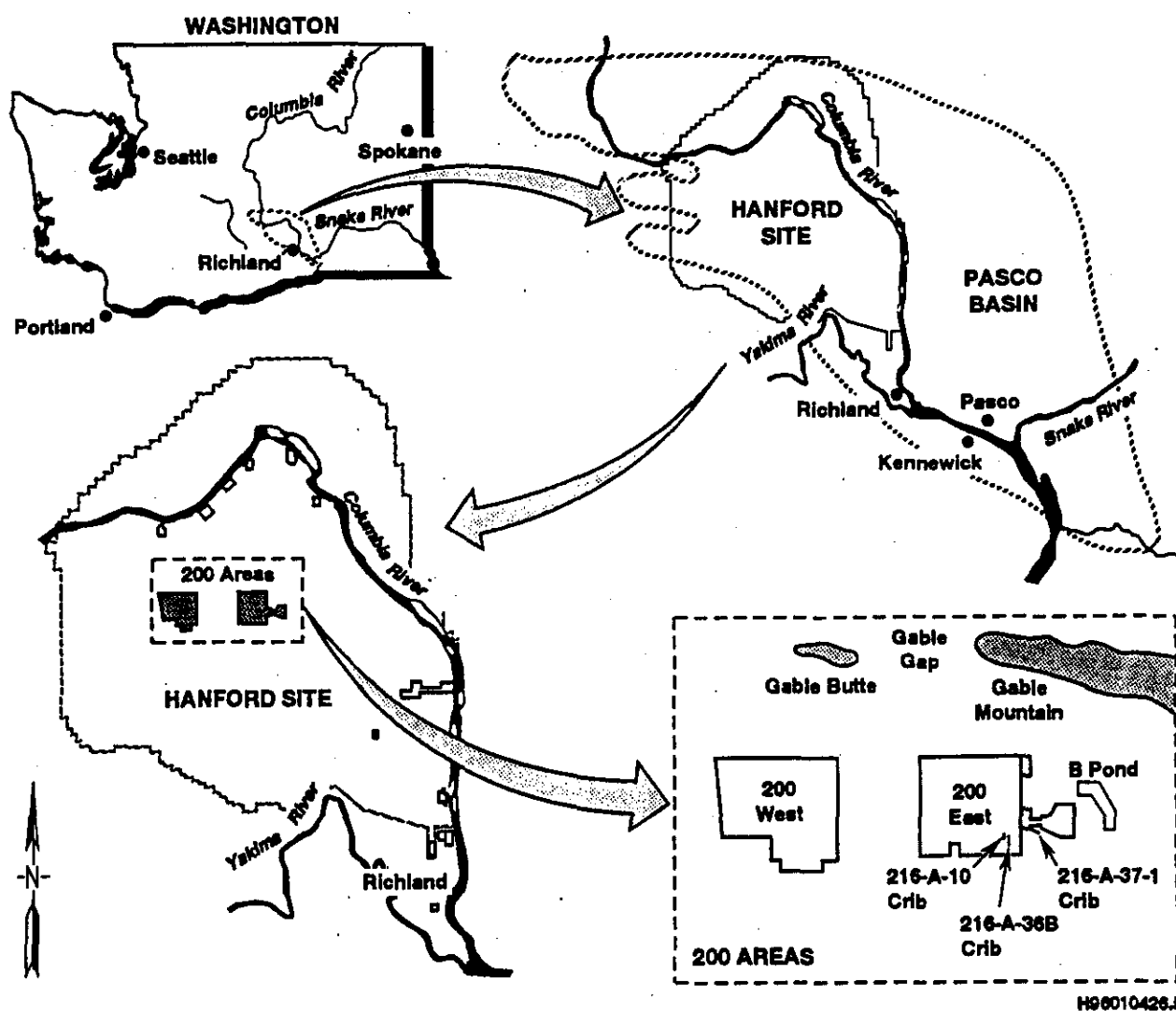


Figure 2.1. Location of the Hanford Site

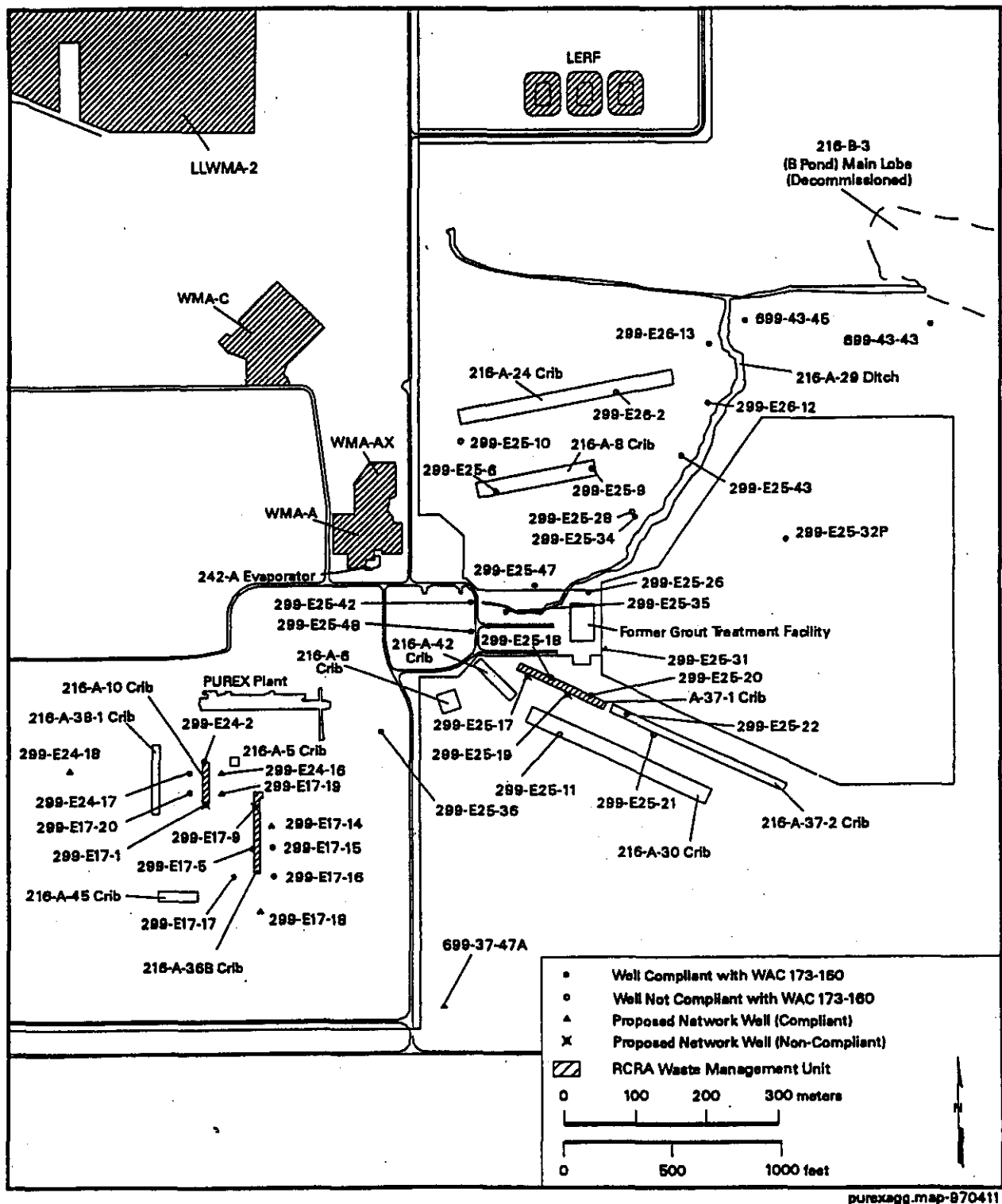


Figure 2.2. Location of the 216-A-10, 216-A-36B, and 216-A-37-1 Cribs and Other Facilities

**PUREX Cribs    216-A-10  
                      216-A-36B  
                      216-A-37-1**

**RCRA TSDs  
Interim Status  
Groundwater Quality Assessment Program**

**Goal: In the interim, track the nature,  
extent, and concentration of the groundwater  
contaminant plumes emanating from the  
PUREX Cribs**

**PROPOSED PERMIT MODIFICATION SCHEDULE**  
Attachment 27

YEAR & MODIFICATION FOR TSD UNIT	TYPE OF PERMIT	TPA MILESTONE	OPERABLE UNIT	STATUS & REMARKS
<b>MODIFICATION K (2005)</b>				
Waste Encapsulation and Storage Facility (WESF)	PART B			
207-A South Retention Basin	CLOSURE PLAN	M-20-53 submit closure plan to Ecology 31DEC03	200-PW-4	Based on estimated completion of ROD in 31DEC04
216-A-10 Crib	CLOSURE PLAN	M-20-33 submit closure plan to Ecology 31OCT03	200-PW-2	Based on estimated completion of ROD in 31MAR05
216-A-36B Crib	CLOSURE PLAN	M-20-33 submit closure plan to Ecology 31OCT03	200-PW-2	Based on estimated completion of ROD in 31MAR05
216-A-37-1 Crib	CLOSURE PLAN	M-20-52 submit closure plan to Ecology 31DEC03	200-PW-4	Based on estimated completion of ROD in 31DEC04

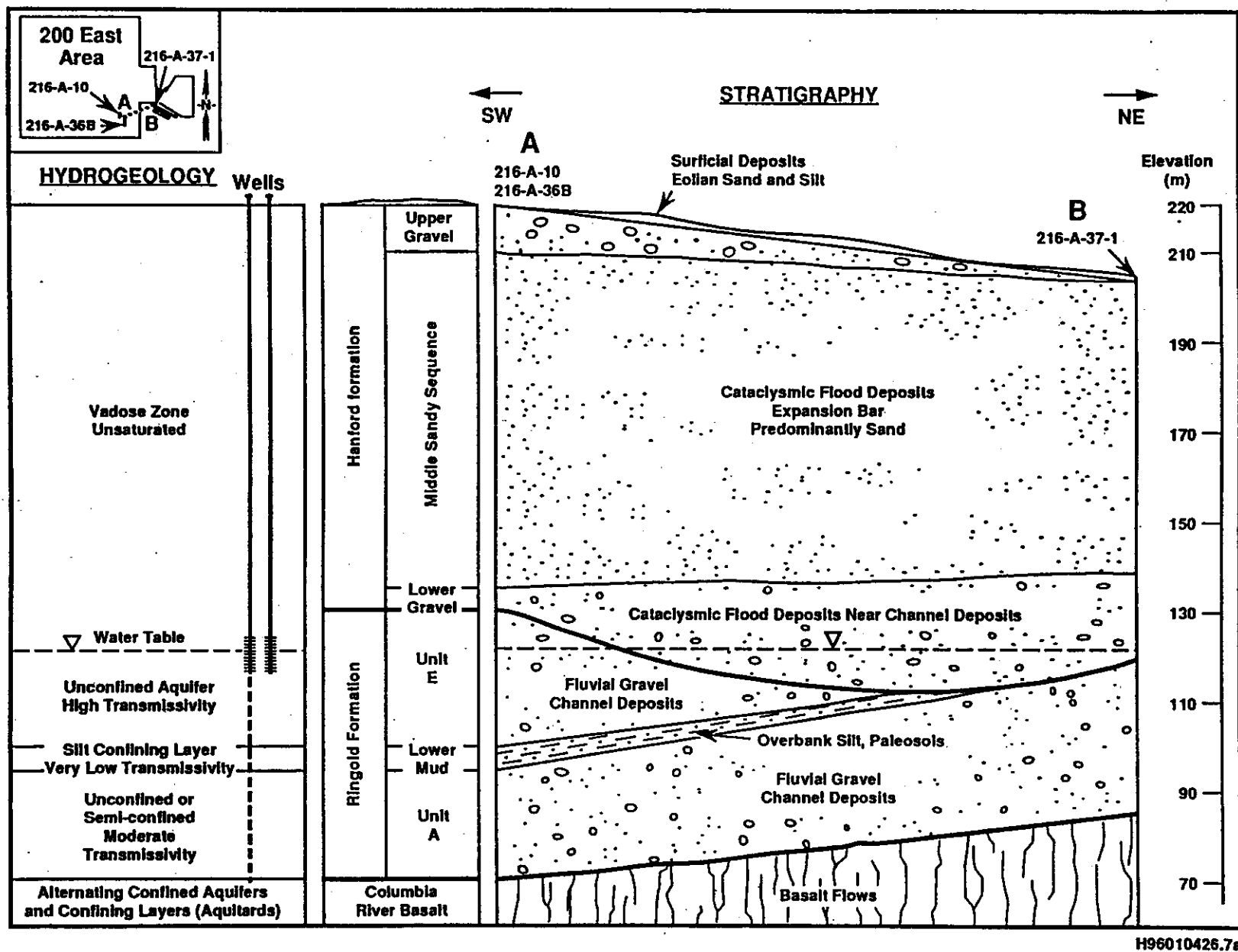
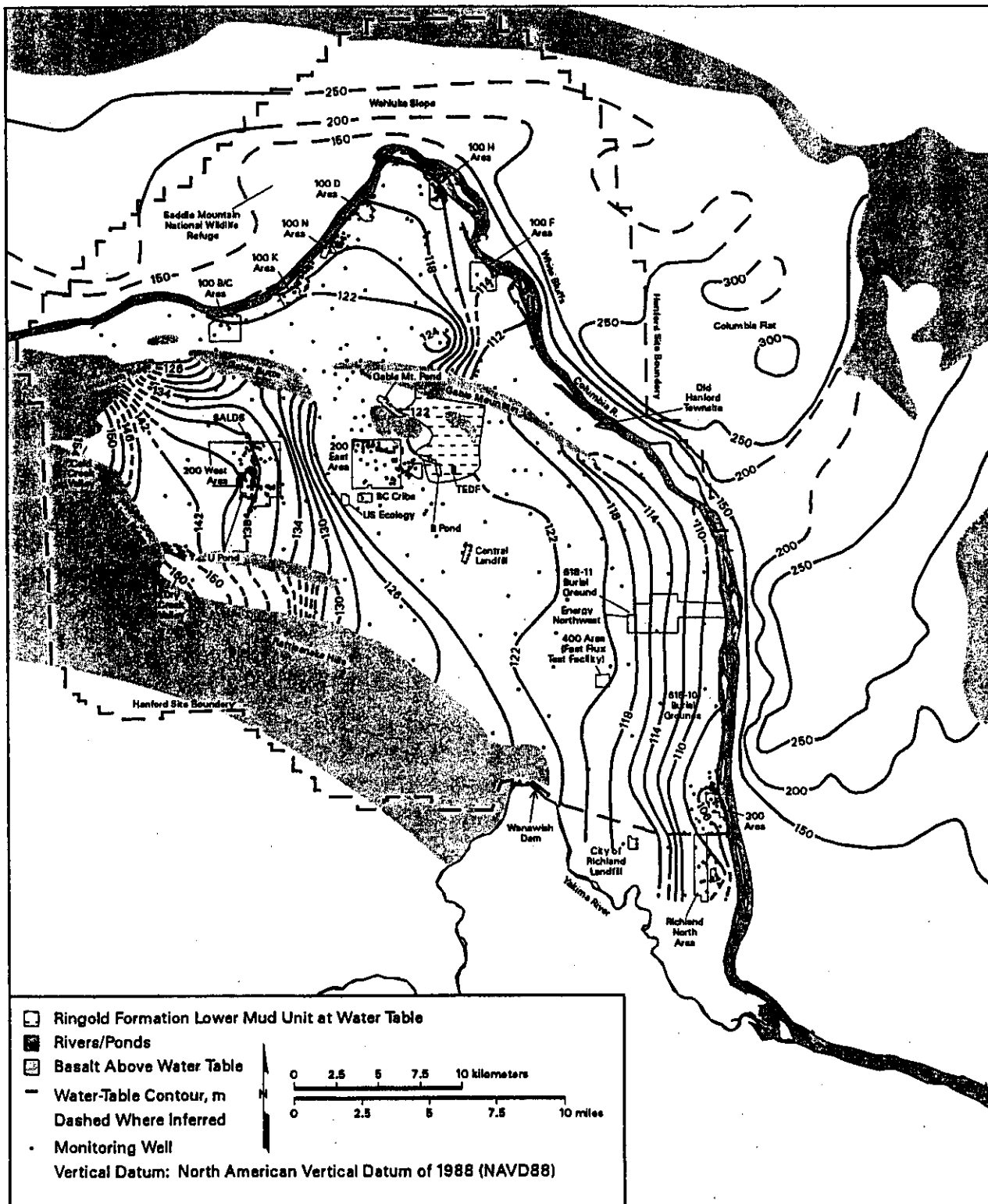


Figure 3.1. Hydrogeology and Stratigraphy Beneath the 216-A-37-1 Cribs and Other Facilities



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Figure 2.1-1. Hanford Site and Outlying Areas Water-Table Map, March 1999

**216-A-36B** - 216-A-36 Crib was originally put into operation in 1965, and in early 1966 the crib was separated into A and B sections. In March '66 discharges resumed in B crib only. From '72 – '82 the crib wasn't used. Put back into service in '82 and operated until 1987.

**216-A-10** - Crib was first used in 1956 at the first PUREX startup. Used continuously until 1973. Used periodically in 1977, 1978, and 1981. Used continuously again from 1982 to 1987. Was replaced by 216-A-45 Crib in 1987.

**216-A-37-1** - Operated March 1977 to April 1989.

Table 4.2. 216-A-10 Crib Contaminant Screening Summary

<b>Process Knowledge</b>	Waste consisted of process distillate discharge that was characteristically acidic and contained concentrated salts. Other wastes included aliphatic hydrocarbon compounds, organic complexants, and radionuclides including $^3\text{H}$ , Pu, U, $^{90}\text{Sr}$ , $^{134,137}\text{Cs}$ , $^{103,106}\text{Ru}$ , $^{60}\text{Co}$ , $^{113}\text{Sn}$ , $^{147}\text{Pm}$ , $^{241}\text{Am}$ , and $^{129}\text{I}$ .		
<b>Constituents Detected 1988-1994<sup>(a)</sup> in Groundwater</b>	1,1,1-Trichloroethane 2-Butanone 4,4'-DDT Acetone Al Ammonia Sb $^{125}\text{Sb}$ As Ba Be $^7\text{Be}$ Bis(2-ethylhexyl) phthalate B Bromide Cd Ca Carbon disulfide $^{144}\text{Ce/Pr}$ $^{134}\text{Cs}$ $^{137}\text{Cs}$ Chloride Cr	Co $^{60}\text{Co}$ Coliform Bacteria Cu $^{154}\text{Eu}$ $^{155}\text{Eu}$ Fluoride Gross Alpha Gross Beta Hydrazine $^{129}\text{I}$ Fe Pb $^{212}\text{Pb}$ Li Mg Mn Hg Methylene chloride Ni Nitrate Nitrite Pu	K $^{40}\text{K}$ Ra $^{106}\text{Ru}$ Se Si Ag Na Sr (elemental) $^{90}\text{Sr}$ Styrene Sulfate $^{99}\text{Tc}$ Sn Toluene $^3\text{H}$ U $^{234,235,238}\text{U}$ V Zn $^{65}\text{Zn}$ $^{95}\text{Zr/Nb}$
<b>Constituents Detected Since 1994<sup>(a)</sup> in Groundwater</b>	Al Sb $^{125}\text{Sb}$ As Ba Bis(2-ethylhexyl)phthalate Be B Bromide Cd Ca Carbon disulfide Chloride Cr Co $^{60}\text{Co}$	Cu Fluoride Gross Alpha Gross Beta Hydrazine $^{129}\text{I}$ Fe Pb Mg Mn Hg Methylene chloride Ni Nitrate K Ra	$^{106}\text{Ru}$ Se Si Ag Na Sr (elemental) $^{90}\text{Sr}$ Sulfate $^{99}\text{Tc}$ Sn $^3\text{H}$ U $^{234,235,238}\text{U}$ V Zn

Table 4.2. (contd)

Constituents Exceeding Primary and Secondary MCL and DWS Since 1994-1996 <sup>(a)</sup> in Groundwater	Cr (100 ppb) <sup>(b)</sup>	Mn (50 ppb) <sup>(b)</sup>	<sup>106</sup> Ru (30 pCi/L)
	Gross Alpha (15 pCi/L) <sup>129</sup> I (1 pCi/L)	Ni (100 ppb) <sup>(b)</sup>  Nitrate (45,000 ppb)	<sup>3</sup> H (20,000 pCi/L)

MCL - Maximum Contaminant Level  
DWS - Drinking Water Standards  
(a) Listed constituents are from wells 299-E17-1, 299-E17-19, 299-E17-20, 299-E24-17, 299-E24-18, 299-E24-2, and/or 299-E24-36.MCL.  
(b) The unfiltered metal was above the MCL.

Table 4.3. 216-A-36B Crib Contaminant Screening Summary

Process Knowledge	Waste consisted of process condensate from nuclear fuel decladding operations in which zirconium cladding was removed from irradiated fuel by boiling in a solution of ammonium fluoride and ammonium nitrate. Other waste stream constituents included radionuclides of Pu, <sup>3</sup> H, U, <sup>90</sup> Sr, <sup>137</sup> Cs, <sup>103,106</sup> Ru, <sup>60</sup> Co, <sup>113</sup> Sn, <sup>147</sup> Pm, <sup>241</sup> Am, and <sup>129</sup> I.		
Constituents Detected 1988- 1994 <sup>(a)</sup> in Groundwater	2,4-Dichlorophenol 2,4-Dimethylphenol 2-Propanol 4,4-DDE 4,4'-DDT Acetone Al <sup>241</sup> Am Ammonia Sb <sup>125</sup> Sb As Ba Be <sup>7</sup> Be Bis(2-ethylhexyl) phthalate B Bromide Cd Ca <sup>14</sup> C <sup>144</sup> Ce/Pr <sup>134</sup> Cs	<sup>137</sup> Cs Chloride Cr Co <sup>60</sup> Co Coliform Bacteria Copper Cresols (methylphenols) Di-n-butylphthalate <sup>154</sup> Eu <sup>155</sup> Eu Fluoride Gross Alpha Gross Beta <sup>129</sup> I Fe Pb <sup>213</sup> Pb Mg Mn Hg Methyl ethyl ketone Methylene chloride Ni Nitrate	Nitrite Phenol K <sup>40</sup> K Ra <sup>106</sup> Ru Se Si Ag Na Sr (elemental) <sup>90</sup> Sr Sulfate <sup>99</sup> Tc Sn Toluene Trichloromonofluoromethane <sup>3</sup> H U <sup>234,235,238</sup> U V Zn <sup>65</sup> Zn <sup>90</sup> Zr/Nb

Figure 5.1. Location of Far-Field Wells Proposed for Monitoring Network

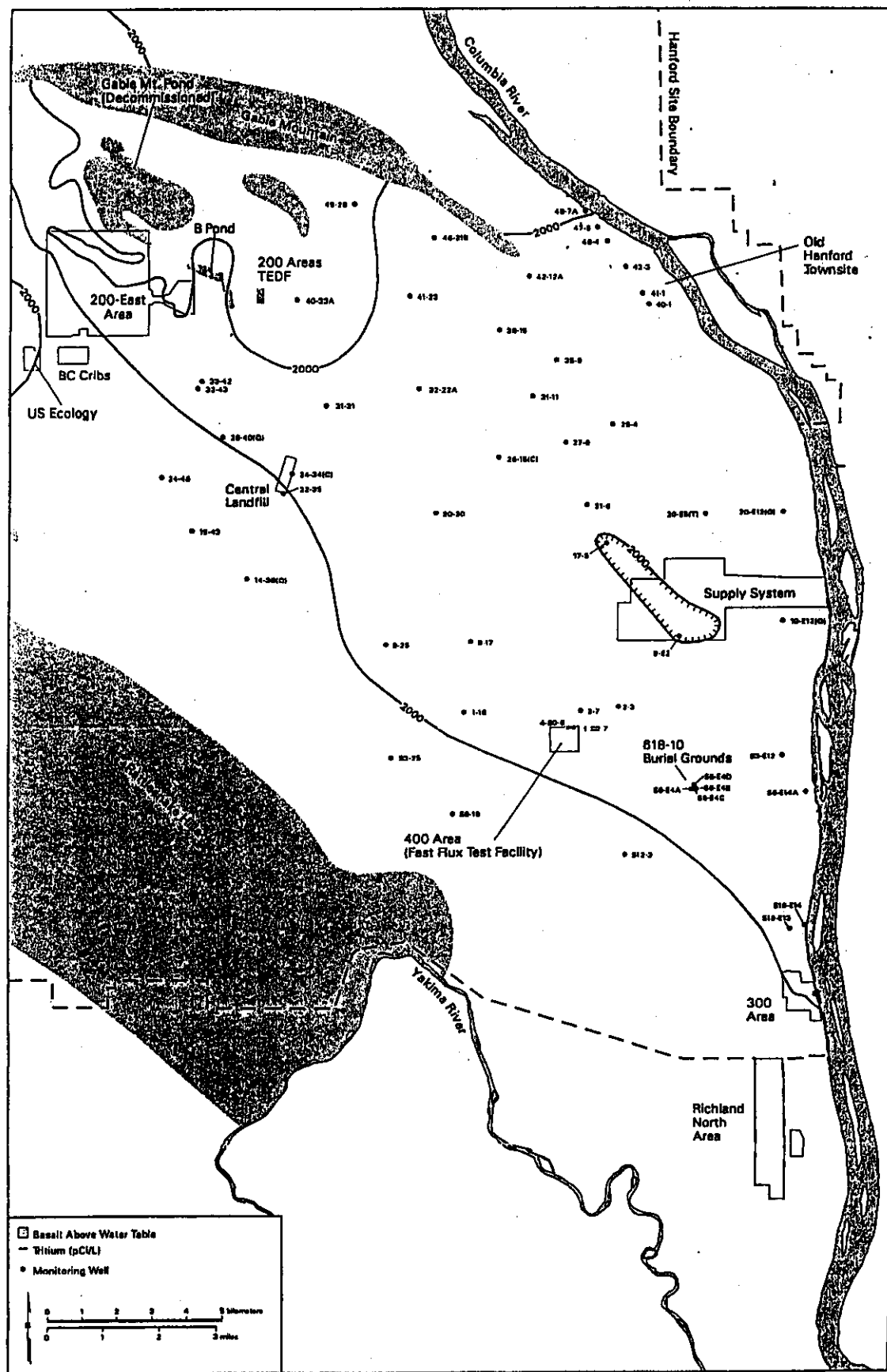


Table 4.4. 216-A-37-1 Crib Contaminant Screening Summary

Process Knowledge	Waste consisted of process condensate made up of a low-salt alkaline solution. Major contaminants included ammonia, acetone, hexone, methylene chloride, trichloroethane, tritium, uranium strontium-90, cesium-137, and promethium-147.		
Constituents Detected 1988-1994 <sup>(a)</sup> in Groundwater	1,1,1-Trichloroethane 4,4'-DDD 4,4'-DDT Aldrin Al Ammonia Sb <sup>123</sup> Sb As Ba Be <sup>7</sup> Be Bis(2-ethylhexyl) phthalate B Cd Ca <sup>144</sup> Ce/Pr <sup>134</sup> Cs <sup>137</sup> Cs Chloride Chloroform Cr Co <sup>60</sup> Co Coliform Bacteria	Cu Delta-BHC Dieldrin Dimethoate Endrin Endrin Aldehyde <sup>154</sup> Eu <sup>155</sup> Eu Fluoride Gross Alpha Gross Beta Heptachlor Heptachlor epoxide Hydrazine <sup>129</sup> I Fe Pb Lindane Li Mg Mn Hg Methylene chloride Ni Nitrate	Pentachlorophenol K <sup>40</sup> K Ra <sup>106</sup> Ru Se Si Ag Na Sr (elemental) Sulfate <sup>99</sup> Tc Sn Ti Toluene Tris-2-chloroethyl phosphate <sup>3</sup> H U <sup>234,235,238</sup> U V Zn <sup>65</sup> Zn <sup>93</sup> Zr/Nb m-Cresol
Constituents Detected Since 1994 <sup>(a)</sup> in Groundwater	Al Sb As Ba Be B Cd Ca Chloride Cr Co Cu Fluoride	Gross Alpha Gross Beta Hydrazine <sup>129</sup> I Fe Pb Mg Mn Ni Nitrate K Si	Ag Na Sr (elemental) Sulfate <sup>99</sup> Tc Sn <sup>3</sup> H U <sup>234,235,238</sup> U V Zn

**Table 4.4. (contd)**

<b>Constituents Exceeding Primary and Secondary DWS or MCL Since 1994- 1996<sup>(a)</sup> in Groundwater</b>	Al (200 ppb) <sup>(b)</sup>	<sup>129</sup> I (1 pCi/L)	Nitrate (45,000 ppb)
	Sb (6 ppb)	Fe (300 ppb) <sup>(b)</sup>	<sup>3</sup> H (20,000 ppb)
	Cd (5 ppb) <sup>(b)</sup>	Mn (50 ppb) <sup>(b)</sup>	Zn (5000 ppb) <sup>(b)</sup>
	Cr (100 ppb) <sup>(b)</sup>	Ni (100 ppb) <sup>(b)</sup>	
<p>MCL - Maximum Contaminant Level  DWS - Drinking Water Standards  (a) Listed constituents are from wells 299-E25-11, 299-E25-18, 299-E25-19, 299-E25-20, 299-E25-31, and/or 299-E25-44.  (b) The unfiltered metal was above the MCL.</p>			

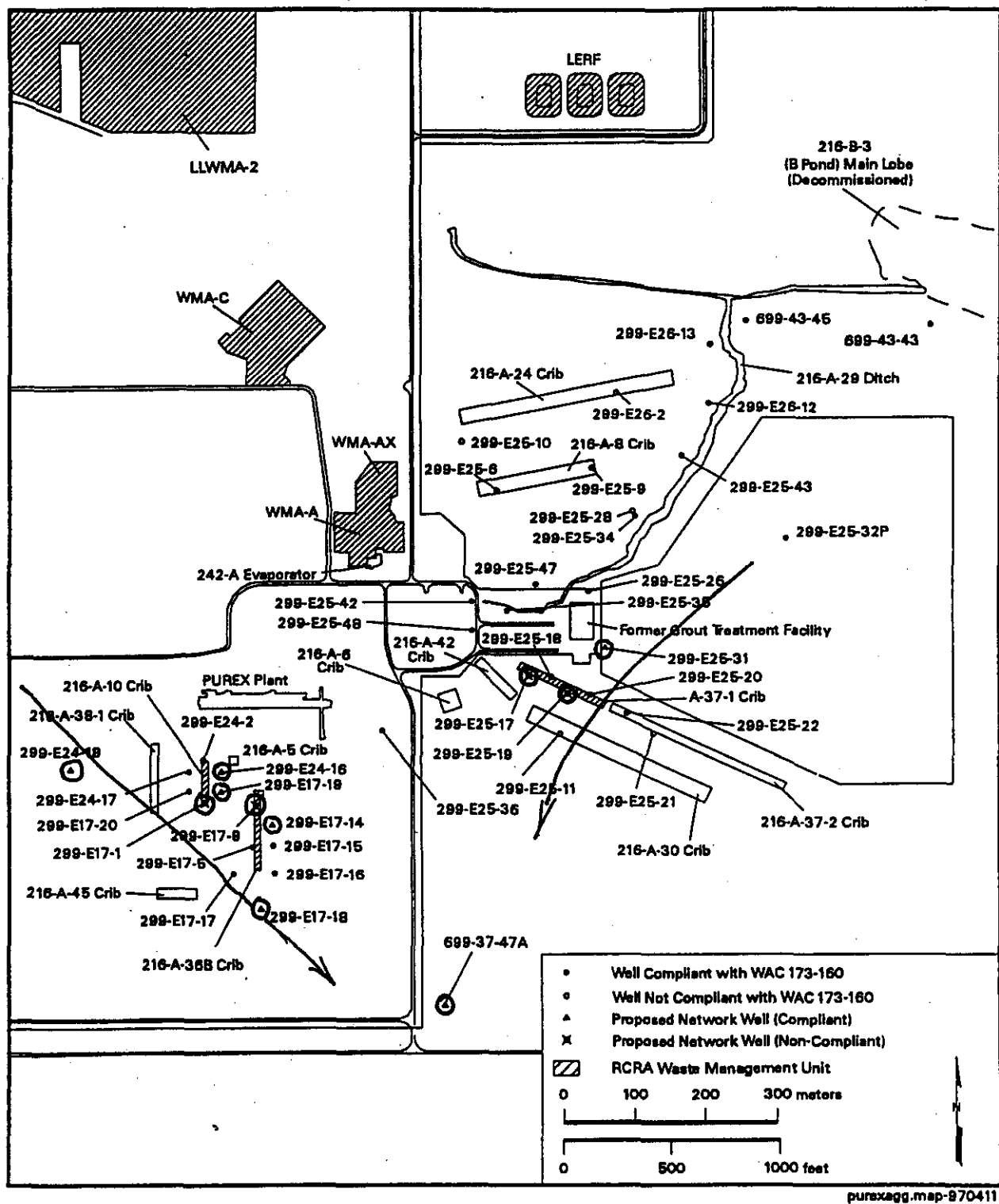


Figure 2.2. Location of the 216-A-10, 216-A-36B, and 216-A-37-1 Cribs and Other Facilities

Table 5.1. Proposed Groundwater Monitoring Network

Far-Field Wells (Within 2,000 pCi/L Tritium Plume)			
Sampled Once Every Three Years (As a Minimum)			
699-47-5	699-46-21B	699-46-4	699-43-3
699-42-12A	699-41-1	699-41-23	699-40-1
699-38-15	699-35-9	699-33-42	699-32-43
699-32-22A	699-31-11	699-31-31	699-29-4
699-28-40	699-27-8	699-26-15A	699-25-33A
699-24-34B	699-22-35	699-21-6	699-20-E12
699-20-20	699-20-E5	699-17-5	699-10-E12
699-9-E2	699-8-17	699-8-25	699-2-3
699-2-7	699-1-18A	699-S3-E12	699-S6-E4A
699-S6-E14	699-S19-E13	699-S19-E14	699-S0-7
499-S0-8	399-1-18A		
Far-Field Wells (Immediately Outside 2,000 pCi/L Tritium Plume)			
Sampled Once Every Three Years (As a Minimum)			
699-48-7A	399-6-1	699-40-33A	699-24-46
699-19-43	699-14-38	699-S3-25	699-S8-19
699-S12-3	699-S31-1	699-S27-E14	699-S29-E16A
Near-Field Wells			
Sampled Semi-Annually (except for one well at each crib <sup>(b)</sup> )			
Upgradient			
299-E24-18 <sup>(a)</sup> (A-10 Crib)			
299-E25-31 <sup>(a)</sup> (A-37-1 Crib)			
Downgradient			
A-10 Crib	A-36B Crib	A-37-1 Crib	
299-E17-1	299-E17-14 <sup>(a,b)</sup>	299-E25-19 <sup>(b)</sup>	
299-E24-16 <sup>(a,b)</sup>	299-E17-17 <sup>(a)</sup>	299-E25-17	
299-E17-19 <sup>(a)</sup>	299-E17-9	299-37-47A <sup>(a)</sup>	
(a) Well meets standards of WAC 173-160			
(b) Well sampled quarterly			

Figure 5.1. Location of Far-Field Wells Proposed for Monitoring Network

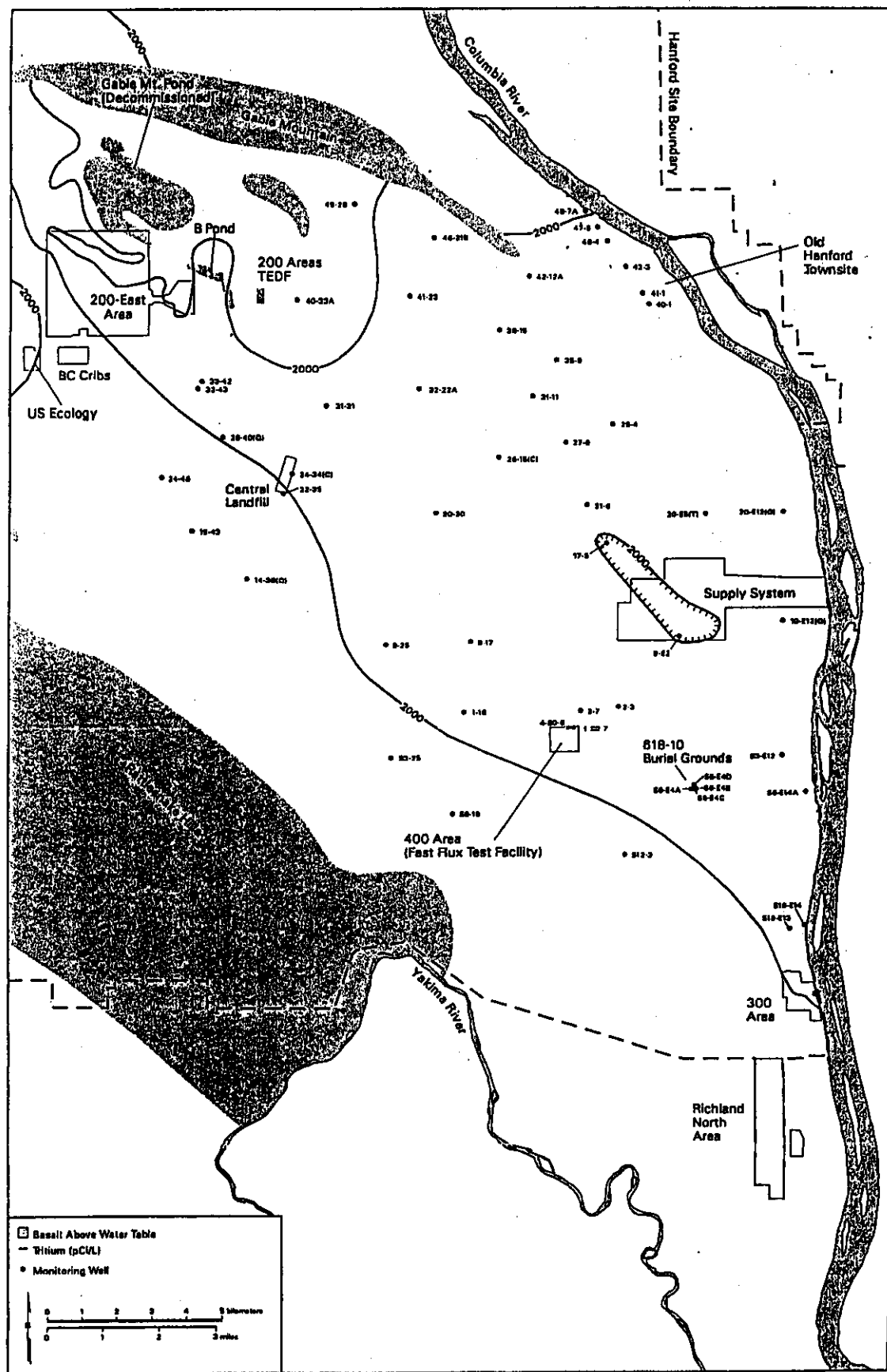


Table 5.2. Combination Network Constituent List

Far-Field Wells	Near-Field Wells
Field-Analyzed parameters:	Field-Analyzed parameters:
pH	pH
specific conductance	specific conductance
temperature	temperature
turbidity	turbidity
	turbidity
	phenols
	ICP metals
anions (Nitrate)	anions
	gross alpha
	gross beta
Site-Specific Parameters:	Site-Specific Parameters:
$^3\text{H}$	alkalinity
$^{129}\text{I}$	ammonium ion
	As
	$^{129}\text{I}$
	$^3\text{H}$
	$^{90}\text{Sr}$

## **More Recently: FY-1999 Annual Report**

### **Constituents Exceeding DWS In At Least One Well Of the Near-Field Network Wells**

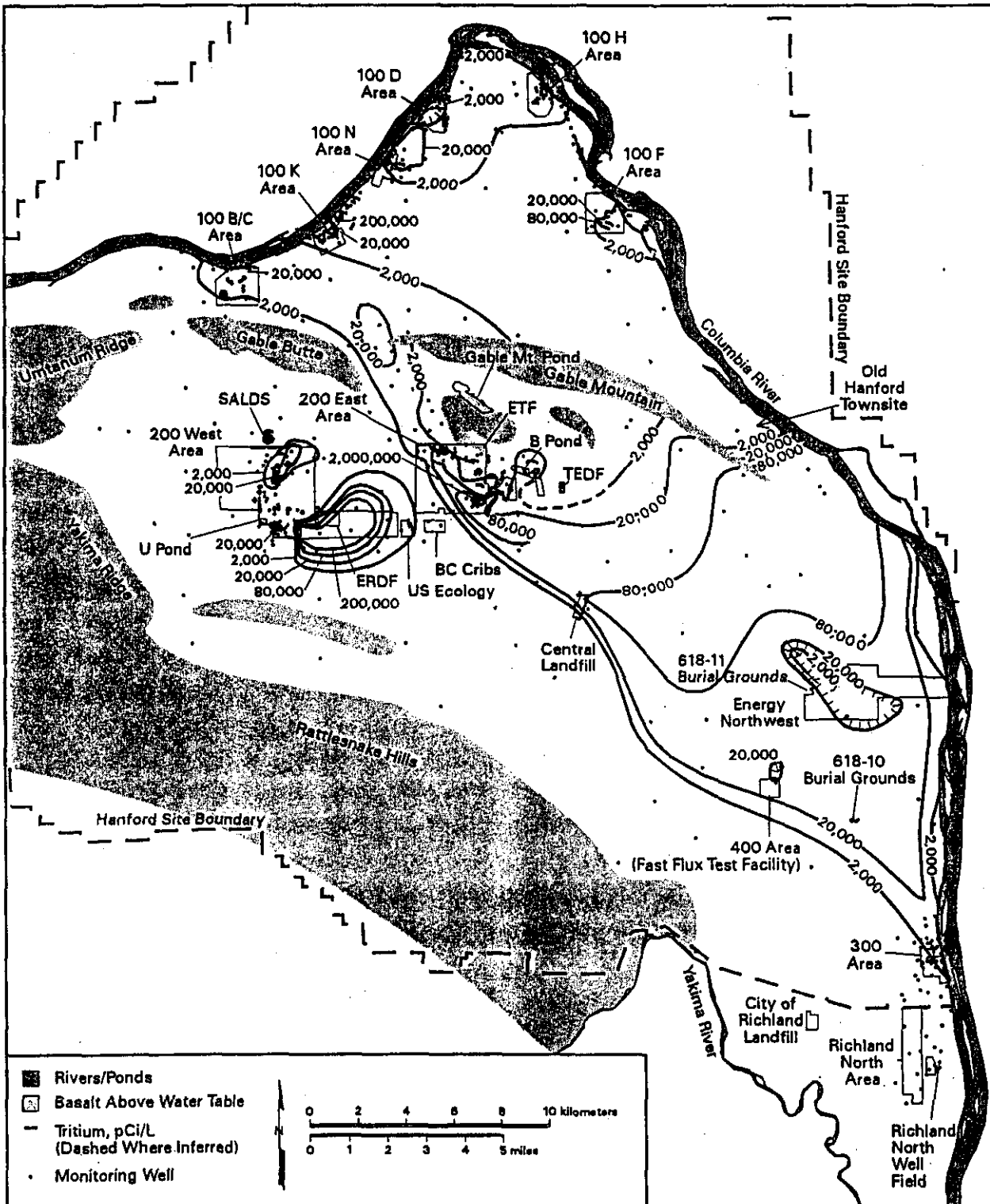
**Iodine -129** (all up- and down-gradient network wells)

**Nitrate** - (all network wells near 216-A-10 and 216-A-36B cribs)

**Manganese** - (was above DWS at 216-A-37-1 crib, but below now)

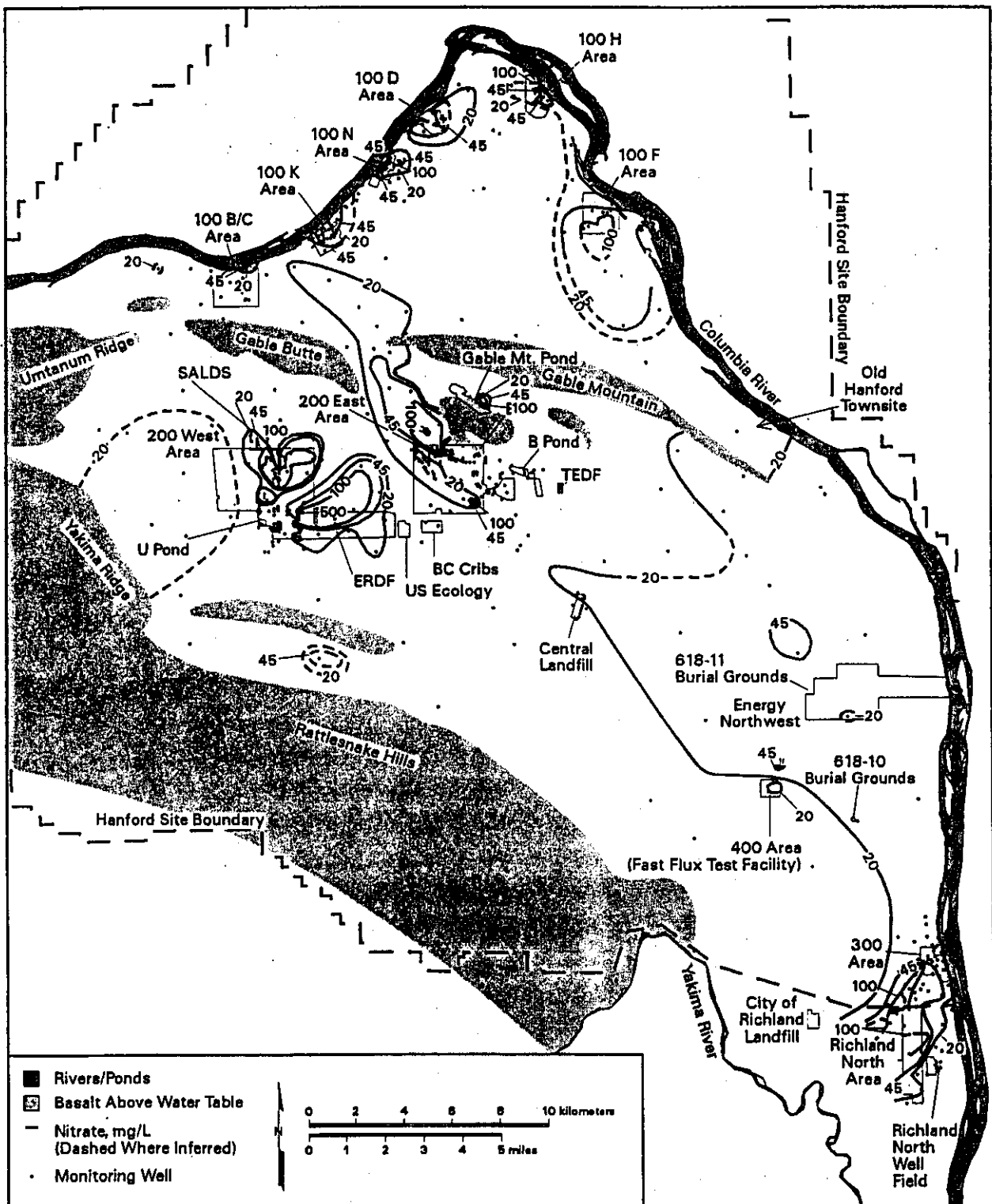
**Tritium** - (all downgradient wells except 299-E25-17 at A-37-1)

**Strontium-90 and Gross Beta** - (in well 299-E17-14 only, A-36B)



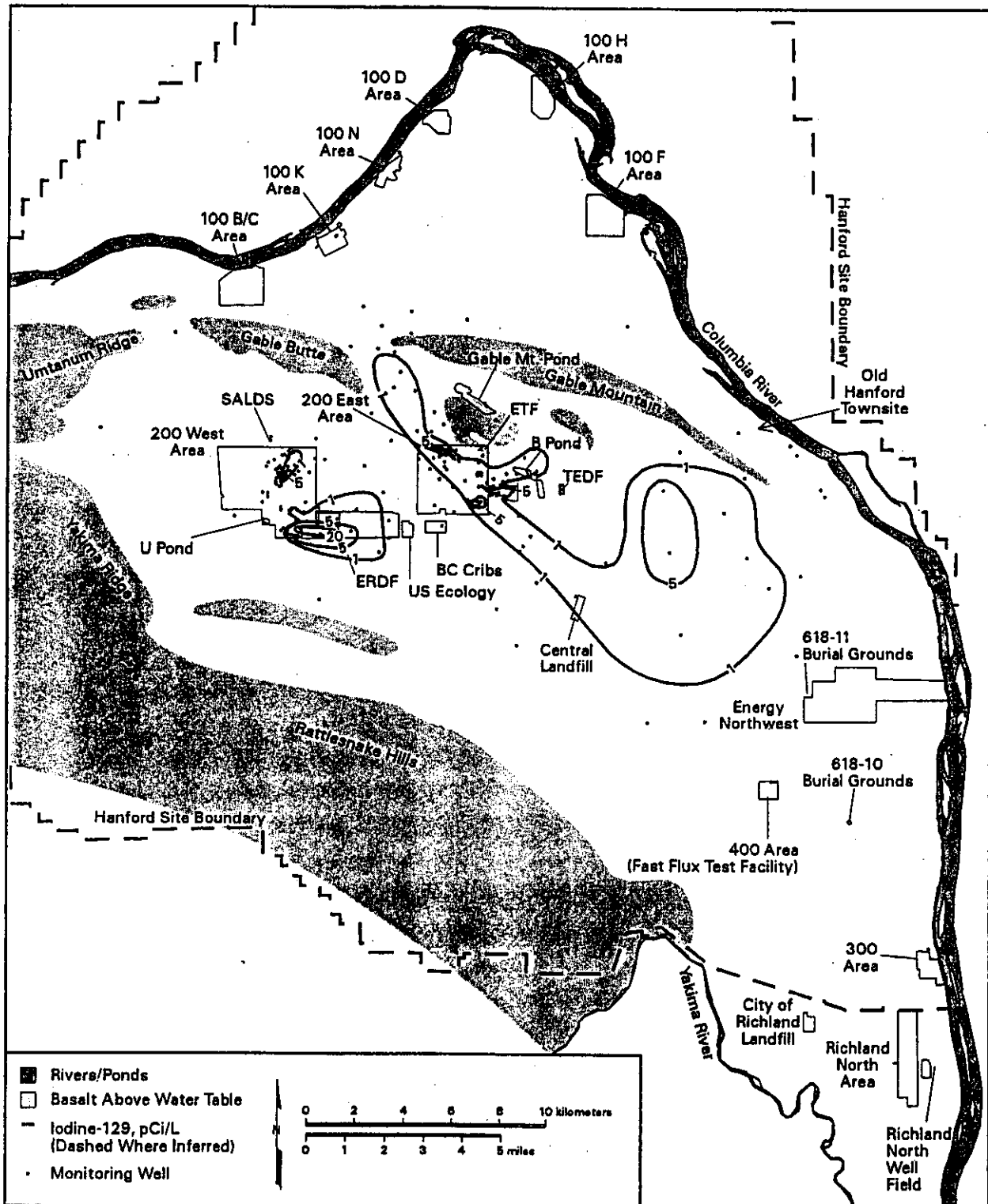
can\_gwrep98\_18 February 03, 2000 8:40 AM

Figure 2.1-3. Average Tritium Concentrations on the Hanford Site, Top of Unconfined Aquifer



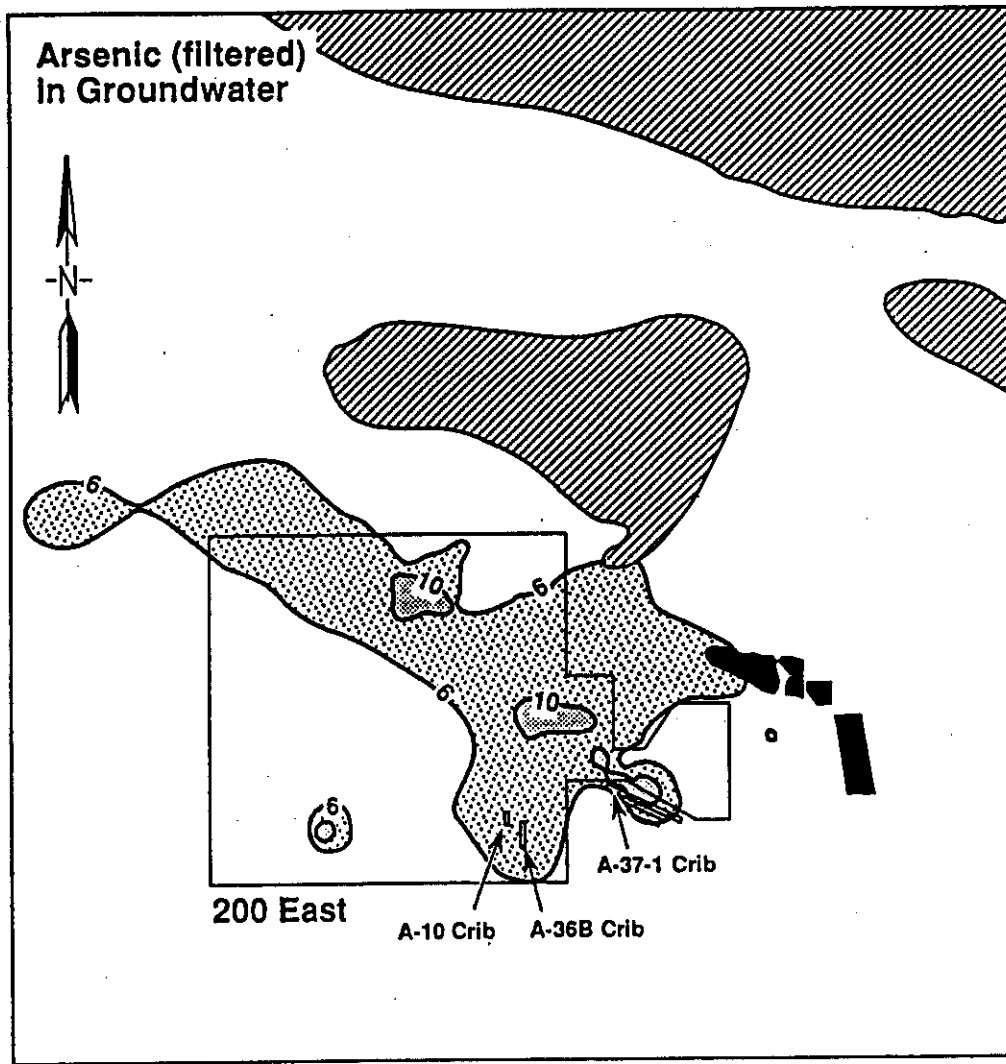
can\_gwresp99\_19 February 29, 2000 8:55 AM

Figure 2.1-4. Average Nitrate Concentrations on the Hanford Site, Top of Unconfined Aquifer



can\_gwrep89\_20 February 03, 2000 4:22 PM

Figure 2.1-5. Average Iodine-129 Concentrations on the Hanford Site, Top of Unconfined Aquifer



6- Concentration Isopleth (ppb)

Concentration values shown are average values for the period  
1/1/91 - 10/1/93

Detection Limit	5 ppb
Drinking Water Standard	50 ppb
Maximum Concentration Limit	50 ppb
1/25 Derived Concentration Guide	N/A

Basalt

0 3,000 Feet  
0 1,000 Meters

**Figure 4.2. Arsenic in the Uppermost Aquifer, 200 East Area**

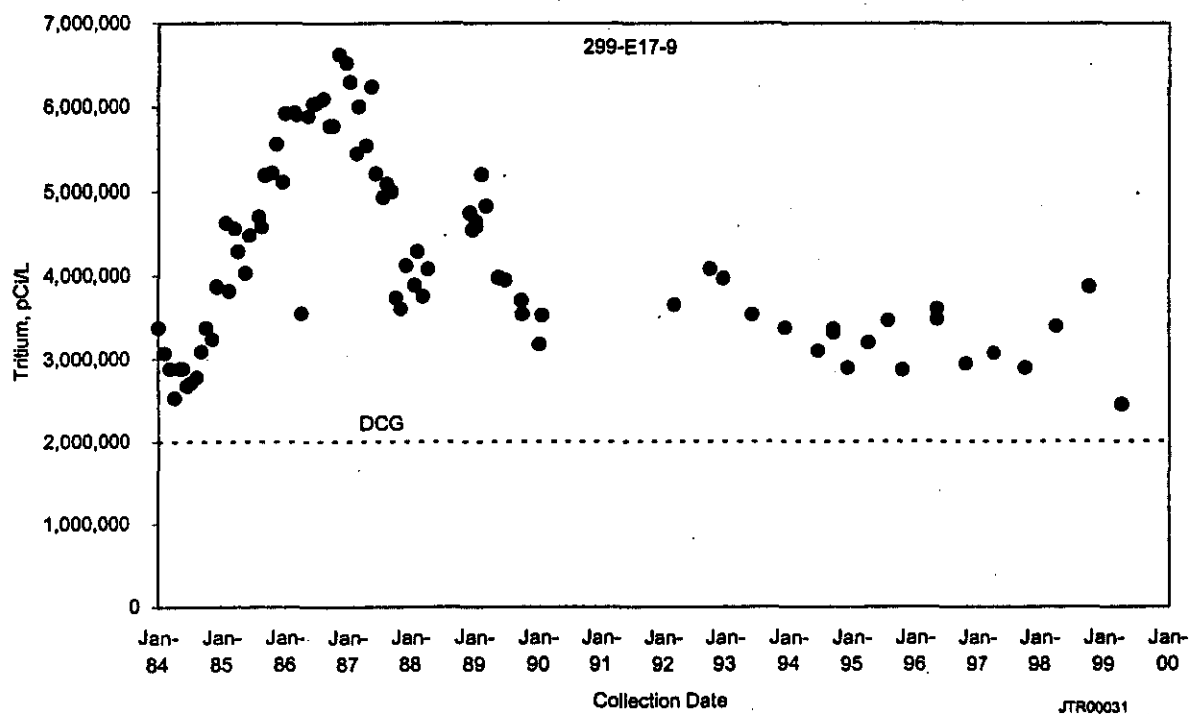


Figure 2.9-13. Tritium in Well 299-E17-9 at 216-A-36B Crib

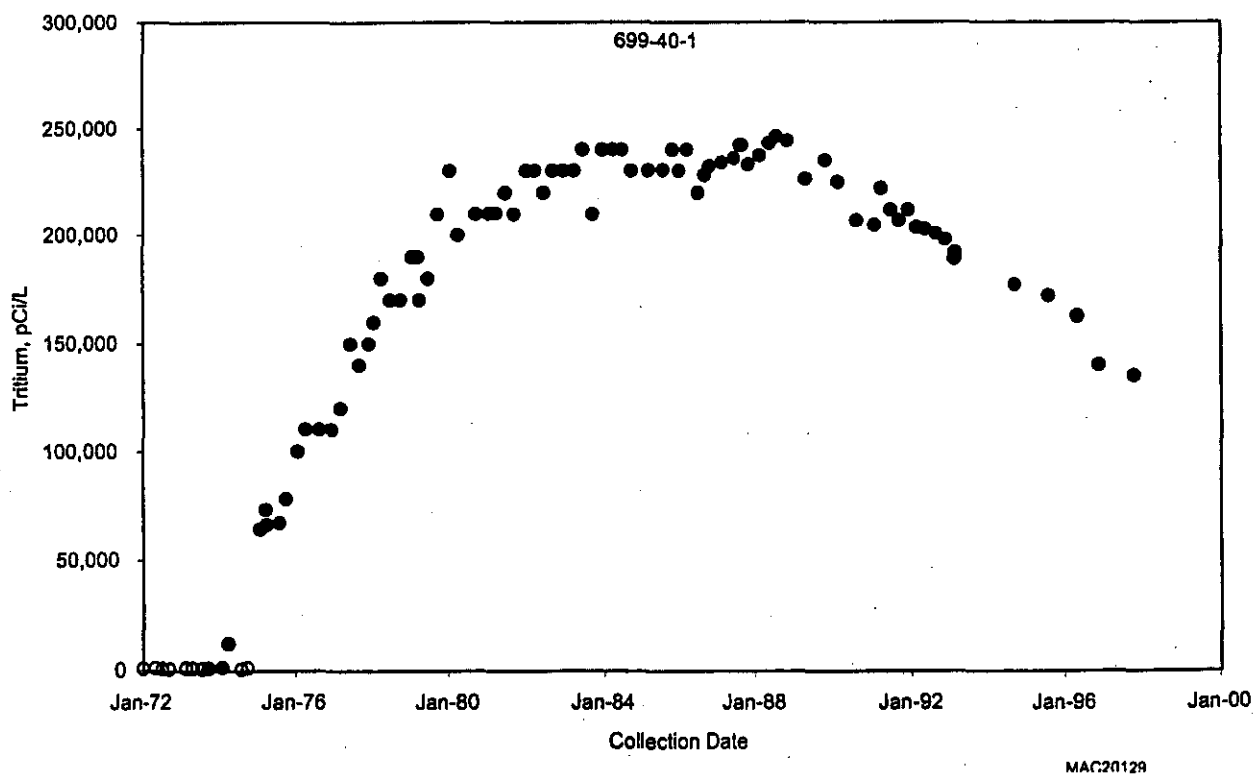
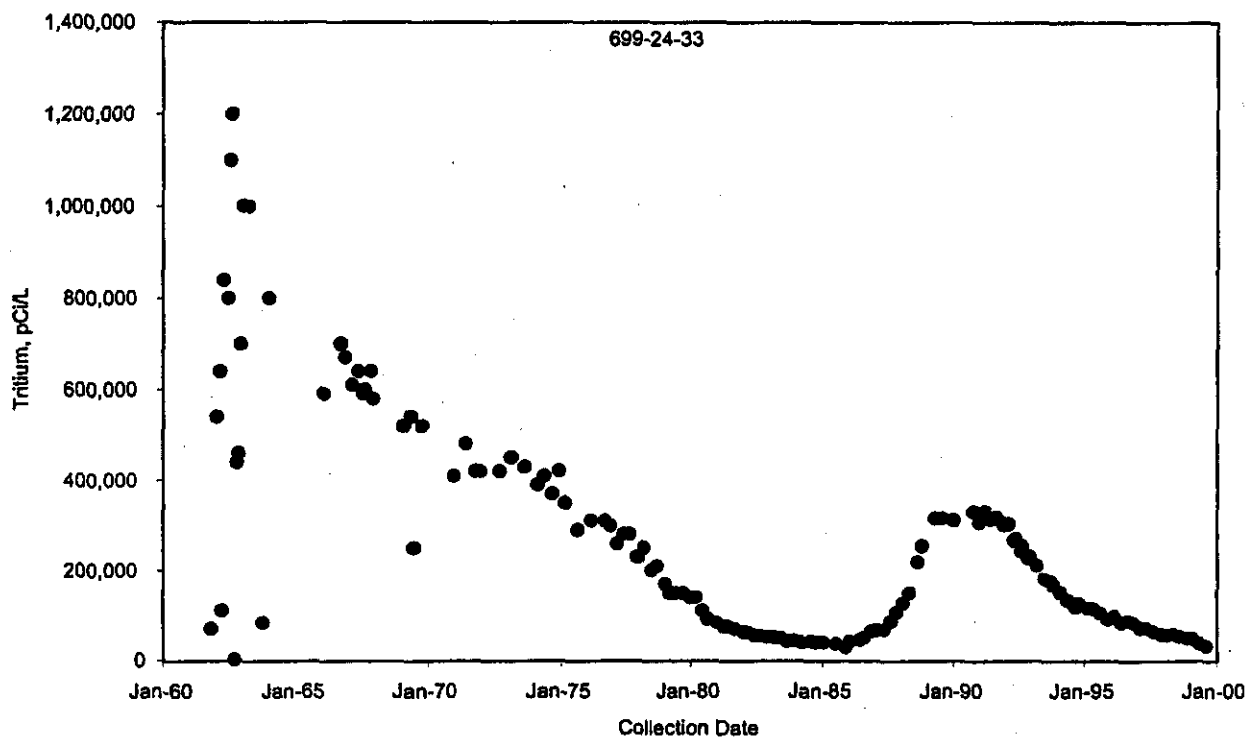
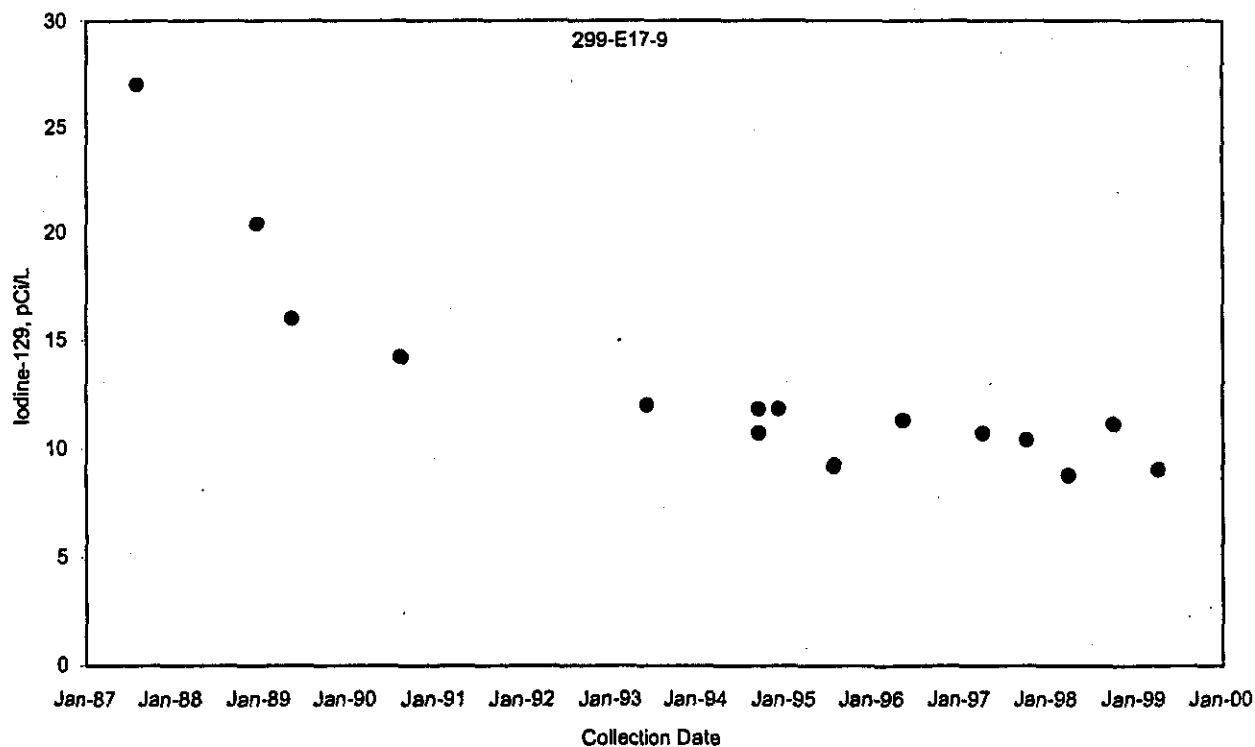


Figure 2.9-14. Tritium in Well 699-40-1 at the 600 Area Near the Old Hanford Townsite



MAC20130

Figure 2.9-15. Tritium in Well 699-24-33 Near the Central Landfill

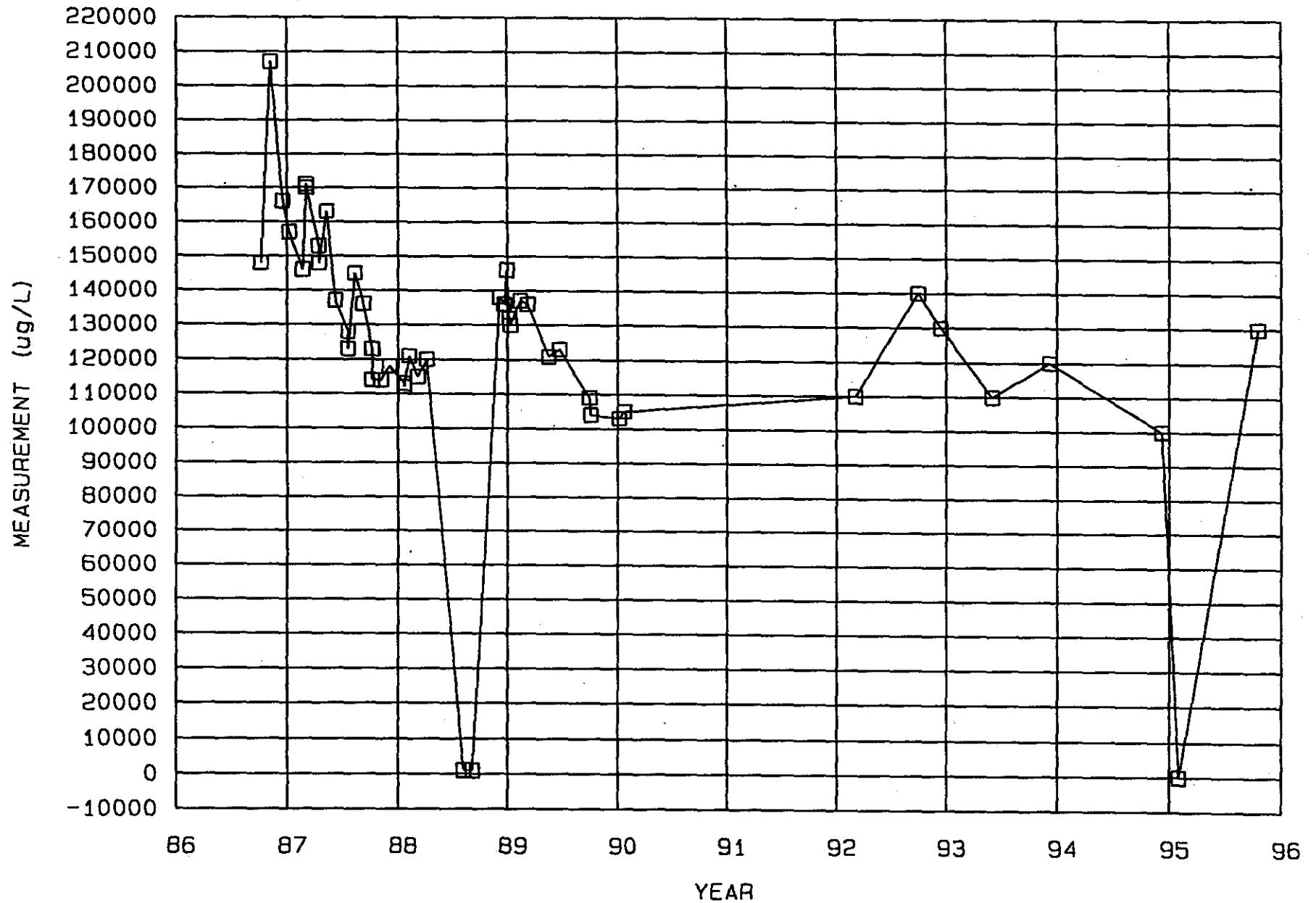


MAC20137

Figure 2.9-16. Iodine-129 in Well 299-E17-9 at 216-A-36B Crib

# Nitrate

Well: 299-E17-9  
Code: NITRATE □



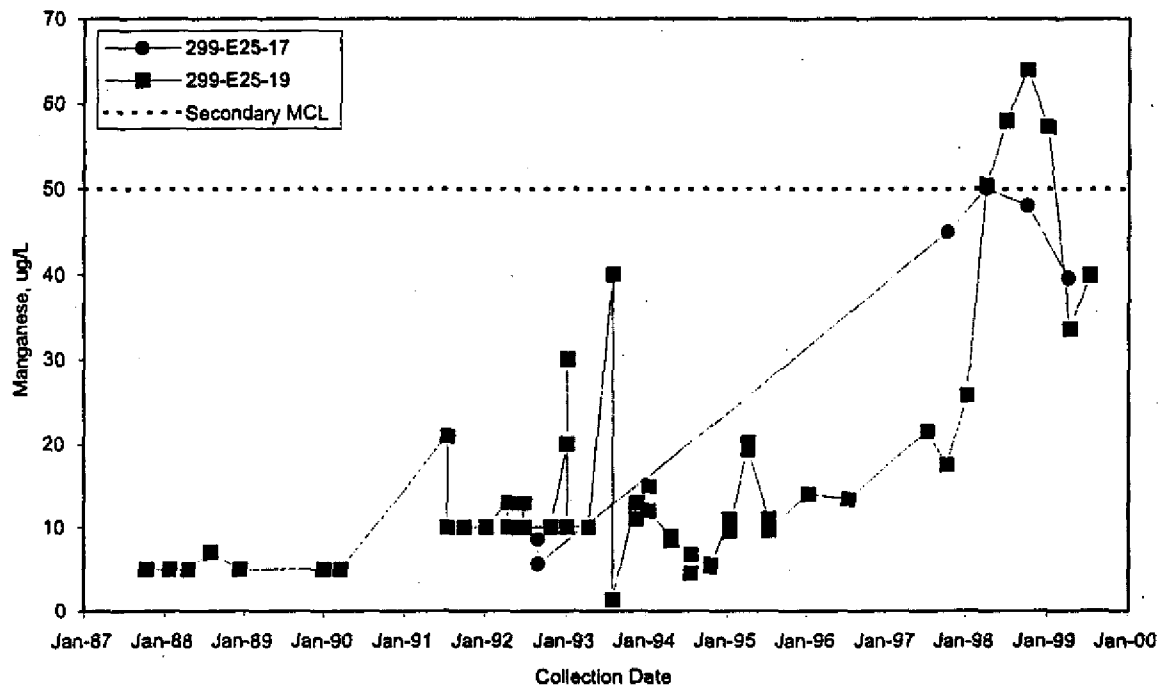


Figure 2.9-17. Manganese at 216-A-37-1 Crib

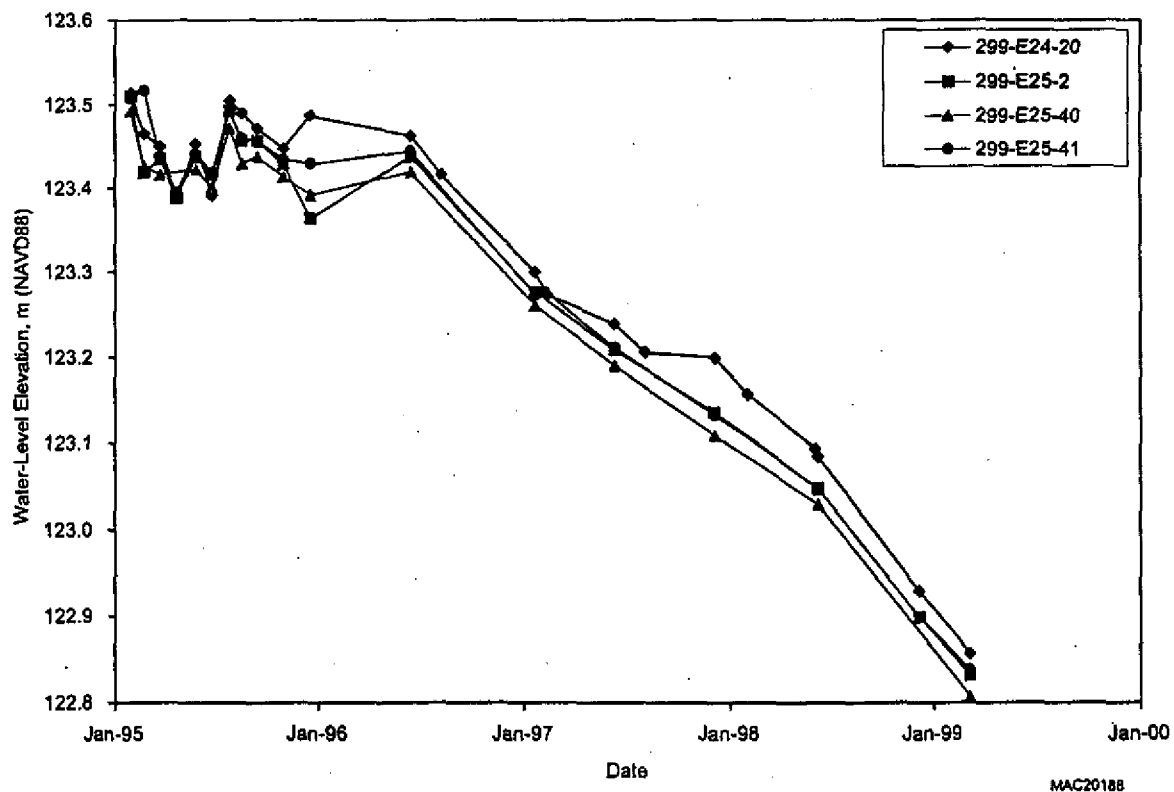
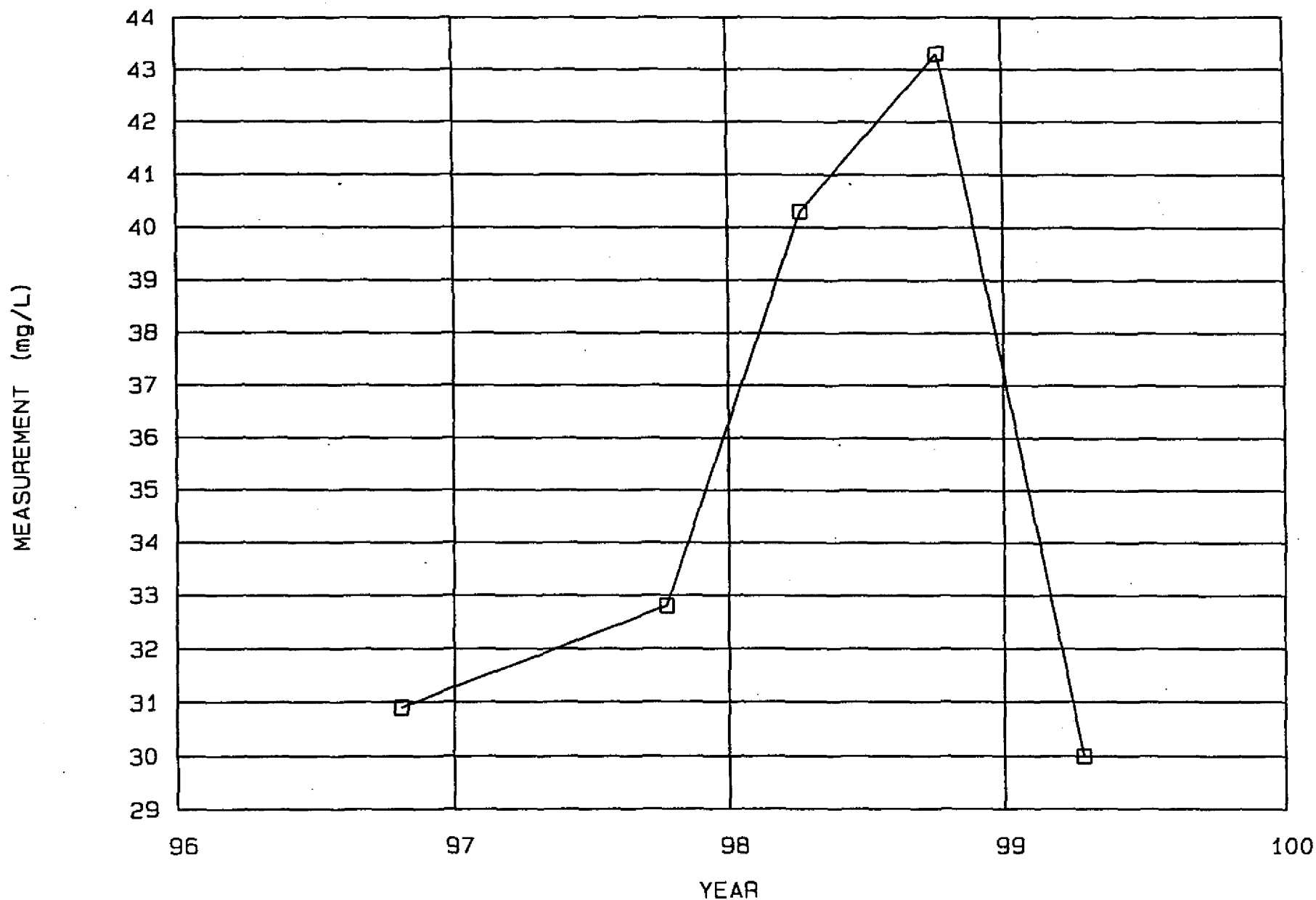


Figure 2.9-18. Hydrographs of Wells at Waste Management Area A-AX Using NAVD88

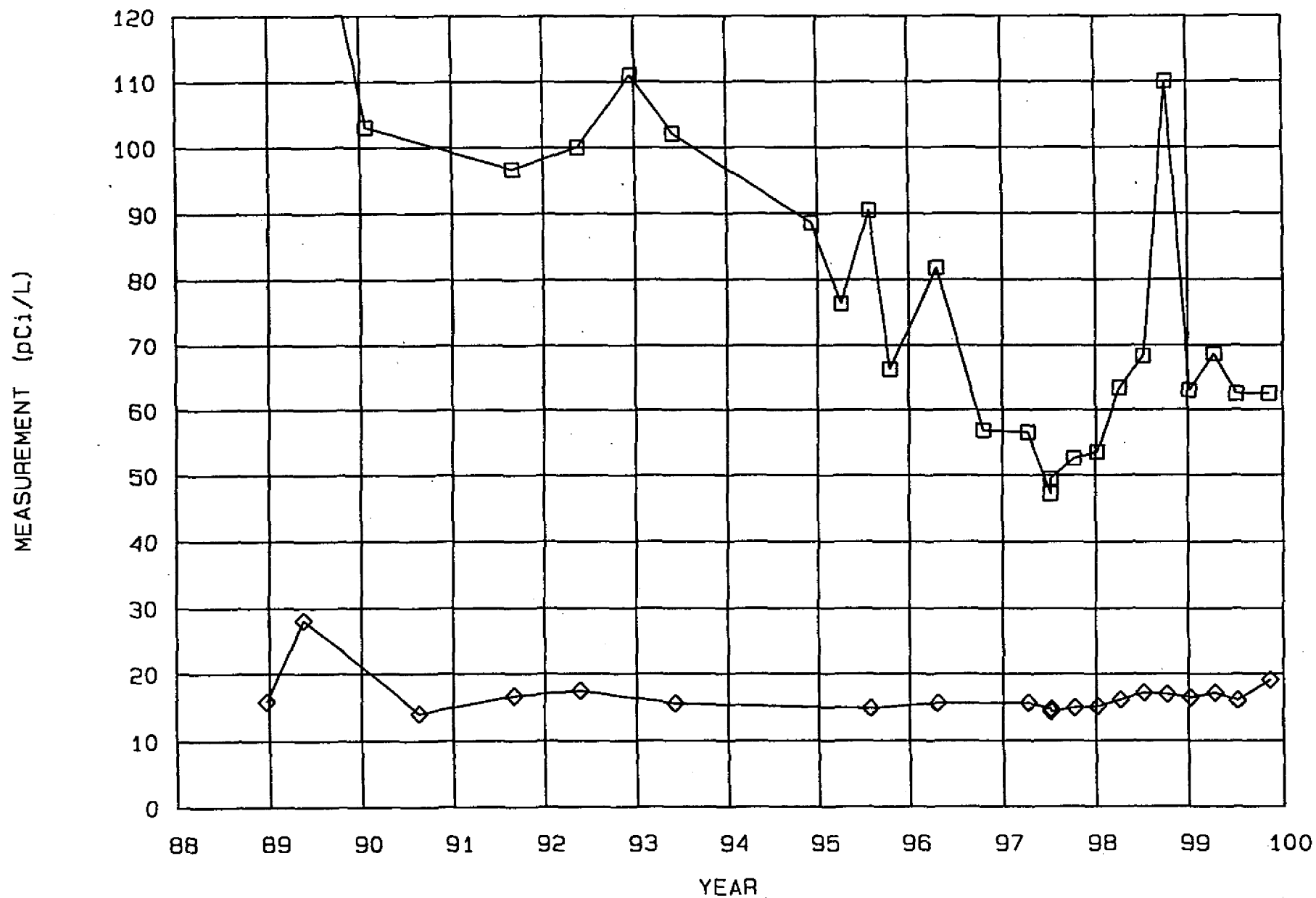
# Nitrogen (In Nitrate)

Well: 299-E17-9  
Code: N03-N □



# Stontium-90 and Gross Beta

Well: 299-E17-14 299-E17-14  
Code: BETA  $\square$  SR-90  $\diamond$



Comparison of Maximum Carbon Tetrachloride Rebound Concentrations  
Monitored at 200-ZP-2 Soil Vapor Extraction Sites  
FY 1997 - FY 2000

Attachment 6

200-ZP-2		November 1996 -		October 1997 -		July 1998 -		July 1999 -	
Location		July 1997		September 1998		September 1999		July 2000	
(Well or Probe)	Site	Zone	Maximum Rebound	months*	Maximum Rebound	months*	Maximum Rebound	months*	Maximum Rebound
/feet bgs			Carbon Tetrachloride	of	Carbon Tetrachloride	of	Carbon Tetrachloride	of	Carbon Tetrachloride
			(ppmv)	rebound	(ppmv)	rebound	(ppmv)	rebound	(ppmv)
79-03/ 5 ft	Z-18	1	0	8	0	3	0	12	
79-06/ 5 ft	Z-1A	1	not measured		not measured		1.4	12	
79-11/ 5 ft	Z-1A	1	0	8	0	6	2.9	12	
86-05/ 5 ft	Z-9	1	not measured		not measured		0	3	
86-05-01/ 5 ft	Z-9	1	not measured		not measured		0	3	
86-06/ 5 ft	Z-9	1	1.3	8	0	9	1.9	6	
87-05/ 5 ft	Z-1A	1	not measured		0	3	1.0	12	
87-09/ 5 ft	Z-1A	1	not measured		1.5	3	2.6	12	
94-02/ 5 ft	Z-9	1	0	8	not measured		1.4	3	
95-11/ 5 ft	Z-9	1	0	8	2.1	9	2.5	6	
95-12/ 5 ft	Z-9	1	1.1	8	1.5	9	1.3	6	
95-14/ 5 ft	Z-9	1	not measured		not measured		0	3	
CPT-13A/ 9 ft	Z-1A	2	not measured		0	6	1.0	12	
CPT-16/ 10 ft	Z-9	2	not measured		0	9	1.5	6	
CPT-17/ 10 ft	Z-9	2	not measured		4.2	9	5.1	6	5.1 13
CPT-18/ 15 ft	Z-9	2	not measured		6.5	9	5.0	6	5.2 13
CPT-31/ 25 ft	Z-1A	2	not measured		0	6	0	12	
CPT-16/ 25 ft	Z-9	2	not measured		not measured		not measured		2 13
CPT-32/ 25 ft	Z-1A	2	not measured		9.1	6	10	12	9.4 10
CPT-30/ 28 ft	Z-18	2	not measured		not measured		3.2	12	1.4 10
CPT-13A/ 30 ft	Z-1A	2	2.2	8	not measured		not measured		3.4 10
CPT-7A/ 32 ft	Z-1A	2	not measured		2.3	6	5.4	12	6.2 10
CPT-27/ 33 ft	Z-9	2	1.2	8	not measured		not measured		1.6 13
CPT-1A/ 35 ft	Z-18	2	2.0	8	1.4	3	3.0	12	4.2 10
CPT-33/ 40 ft	Z-1A	2	not measured		2.0	3	2.6	12	
CPT-34/ 40 ft	Z-18	2	2.3	8	not measured		1.7	12	
CPT-21A/ 45 ft	Z-9	2	65.6	8	52.7	9	57	3	84 13
W15-220ST/ 52 ft	Z-9	2	2	8	not measured		1.6	3	
CPT-28/ 60 ft	Z-9	2	not measured		1.5	0	3.7	3	
CPT-9A/ 60 ft	Z-9	2	45.5	8	41.1	0	44	3	68 13
CPT-30/ 68 ft	Z-18	2	1.7	8	not measured		3.0	12	
CPT-13A/ 70 ft	Z-1A	2	5.2	8	not measured		5.6	12	
CPT-24/ 70 ft	Z-9	2	not measured		3.2	9	3.6	3	
W15-219SST/ 70 ft	Z-9	2	14.6	8	not measured		7.6	3	
CPT-31/ 76 ft	Z-1A	2	4.0	8	not measured		4.2	12	
CPT-33/ 80 ft	Z-1A	2	5.8	8	not measured		9.2	12	
W15-82/ 82 ft	Z-9	2	28.9	8	5.5	9	46	6	43 13
W15-95/ 82 ft	Z-9	2	not measured		15.3	9	39	6	24 13
CPT-21A/ 86 ft	Z-9	2	221	8	206	9	148	6	195 13
CPT-34/ 86 ft	Z-18	2	36.3	8	5.9	3	0	12	
W15-218SST/ 86 ft	Z-9	2	not measured		not measured		0	3	
CPT-28/ 87 ft	Z-9	2	280	8	230	9	203	6	205 13
CPT-1A/ 91 ft	Z-18	2	3.9	8	not measured		4.2	12	
CPT-4A/ 91 ft	Z-1A	2	not measured		7.7	3	14	12	
CPT-9A/ 91 ft	Z-9	2	103	8	34.5	8	72	3	
W18-252SST/ 100 ft	Z-1A	2	38.2	8	17.8	3	24	12	
W18-152/ 113 ft	Z-12	2	46.8	8	11.1	3	33	12	25 10
W15-217/ 115 ft	Z-9	3	797	8	630	9	561	6	442 13
CPT-24/ 118 ft	Z-9	3	44.6	8	37.7	9	37	6	
W15-220SST/ 118 ft	Z-9	4	21.9	8	not measured		36	3	
W18-158L/ 123 ft	Z-1A	3	not measured		143	3	492	12	196 10
W18-167/ 123 ft	Z-1A	3	323	8	79.7	3	228	12	248 10
W15-219SST/ 130 ft	Z-9	4	298	8	not measured		47	3	
W18-249/ 134 ft	Z-18	3	206	8	20.4	3	215	12	176 10
W18-248/ 136 ft	Z-1A	3	288	8	86.3	3	177	12	186 10
W15-219SST/ 155 ft	Z-9	5	59.6	8	not measured		24	3	
W15-220SST/ 185 ft	Z-9	5	14.5	8	not measured		13	3	
W15-8L/ 189 ft	Z-9	6	22.6	8	17.8	9	1.3	6	
W15-9L/ 189 ft	Z-9	6	18.3	8	15.0	9	15	6	14 13
W18-7/ 200 ft	Z-1A	6	28.5	8	17.3	3	29	12	
W18-6L/ 208 ft	Z-1A	6	36	8	31.3	6	15	12	
W18-12/ 210 ft	Z-18	6	not measured		3.8	3	19	12	

\* - based on location (Z-1A/18/12 or Z-9) of monitoring point; specific points may be beyond SVE zone of influence during particular operating configurations

- Z-18 and Z-12 wells off-line Oct 96 - Apr 98

- CPT-1A, CPT-9A, and possibly CPT-7A appeared to be beyond SVE zone of influence in Oct 96 based on differential pressure (BHI-01105, p. 6-1)

- CPT-9A, CPT-21A, CPT-28 beyond SVE zone of influence in May 96 based on CCl4 concentrations and airflow modeling based on measured vacuums (BHI-01105, p. 6-1)

**Carbon Tetrachloride Rebound Concentrations  
Monitored at 200-ZP-2 Soil Vapor Extraction Sites  
July 1999 - July 2000**

200-ZP-2			07/30/99	09/14/99	9/28/99	10/26/99	11/30/99	12/29/99	01/25/00	03/07/00	06/02/2000	06/27/2000	07/24/2000
Location	Site	Zone											
(Well or Probe)													
/feet bgs			CCl4	CCl4	CCl4	CCl4	CCl4	CCl4	CCl4	CCl4	CCl4	CCl4	CCl4
			(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)
CPT-17/ 10 ft	Z-9	2	2.1	2.6	2.3	1.7	3.1	2.6	2.9	1.7	5.1	3.4	4.17
CPT-18/ 15 ft	Z-9	2	1.3	3.5	0	1.8	1.6	4.3	2.8	2.6	5.2	3.8	1.99
CPT-16/ 25 ft	Z-9	2				0	0	0	0	0	0	1.6	1.35
CPT-32/ 25 ft	Z-1A	2				0	0	1.5	3.8	9.4	8.6	7.2	8.08
CPT-30/ 28 ft	Z-1A	2				0	1.0	1.4	0	0	0	0	0
CPT-13A/ 30 ft	Z-1A	2				0	0	1.6	1.1	2.1	2.5	3.4	2.46
CPT-7A/ 32 ft	Z-1A	2				2.3	1.9	2.8	2.3	4.4	4.7	6.2	3.88
CPT-27/ 33 ft	Z-9	2				1.1	0	1.2	1.2	1.3	1.6	1.3	1.21
CPT-1A/ 35 ft	Z-12	2				2.5	3.1	2.8	4.1	3.3	4.2	3.7	3.72
CPT-21A/ 45 ft	Z-9	2	51.7	56.6	42	50.3	78	70.4	81.6	54.0	94	88.7	91.4
CPT-9A/ 60 ft	Z-9	2	---- (a)	43.9	44.0	32.9	39.3	43.5	38.1	33.2	43.9	67.6	40.3
W15-82/ 82 ft	Z-9	2	---- (a)	42.5	38.1	35.7	23.4	21.2	19.0	29.8	25.5	23.5	25.5
W15-95/ 82 ft	Z-9	2	---- (a)	8.3	7.6	9.0	11.2	12.0	14.5	13.2	21.2	21.7	23.7
CPT-21A/ 86 ft	Z-9	2	66.6	12.6	123	90.7	133	123	141	113	195	186	169
CPT-28/ 87 ft	Z-9	2	49.3	151	105	104	170	180	181	69.7	205	165	174
W18-152/ 113 ft	Z-12	2				1.8	22.1	24.7	17.7	3.7	22.9	3.1	1.8
W15-217/ 115 ft	Z-9	3	68.6	267	26.3	204	317	370	400	92.0	442	358	185
W18-158L/ 123 ft	Z-1A	3				79.6	103	134	132	152	134	196	186
W18-167/ 123 ft	Z-1A	3				88.8	115	144	109	104	248	227	216
W18-249/ 134 ft	Z-18	3				74.8	132	173	149	60.0	176	137	78.3
W18-248/ 136 ft	Z-1A	3				130	96.7	85.5	110	130	183	186	170
W15-9L/ 189 ft	Z-9	6	---- (a)	10.3	1.1	8.6	12.0	12.1	14.4	9.0	12.3	11.9	11.0
(a) sample pump failure													

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